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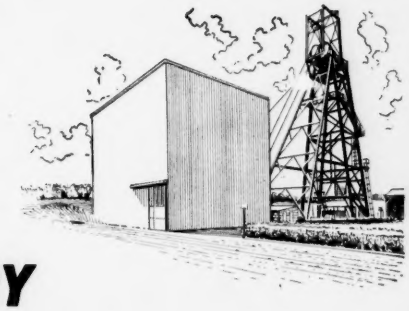

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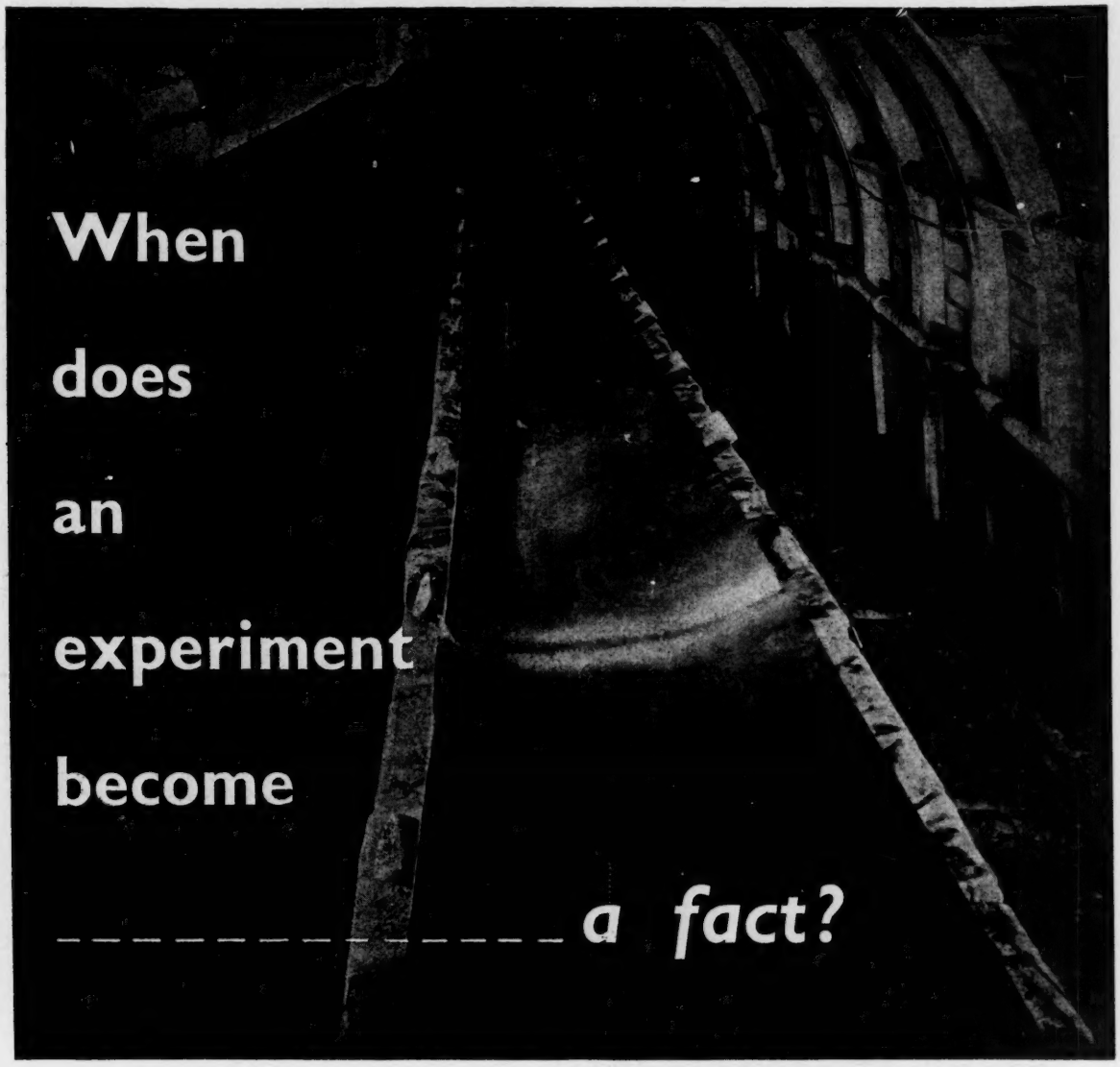

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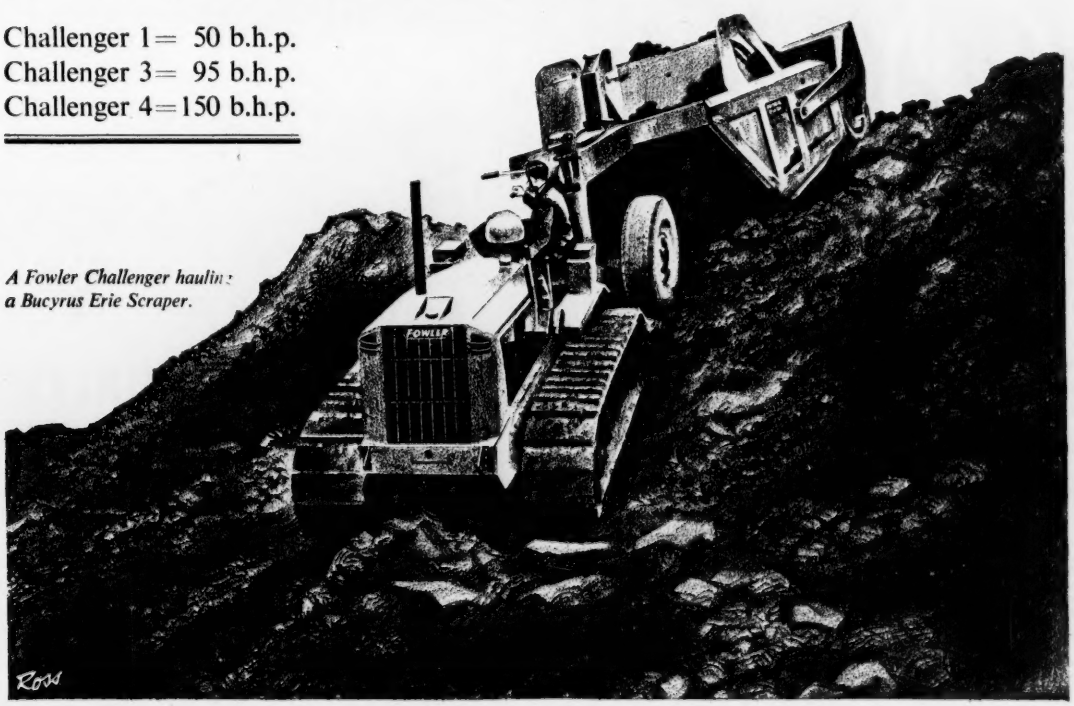

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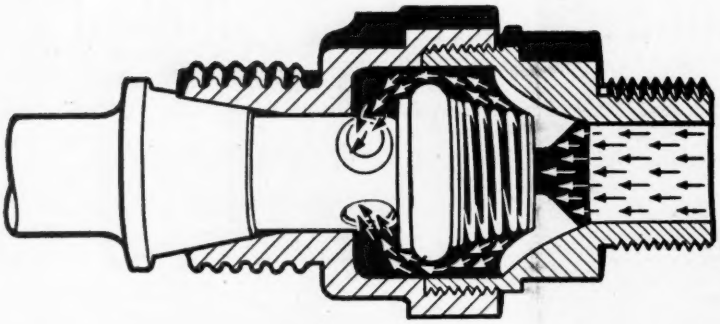

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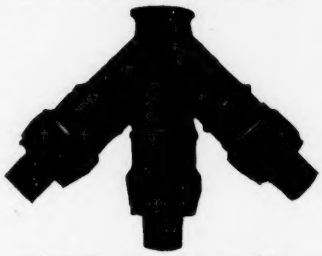

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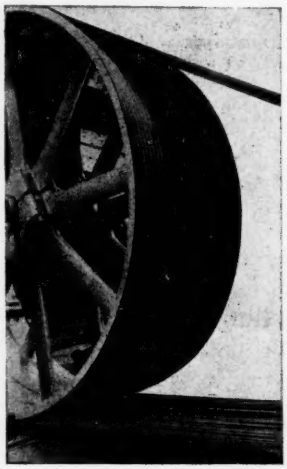

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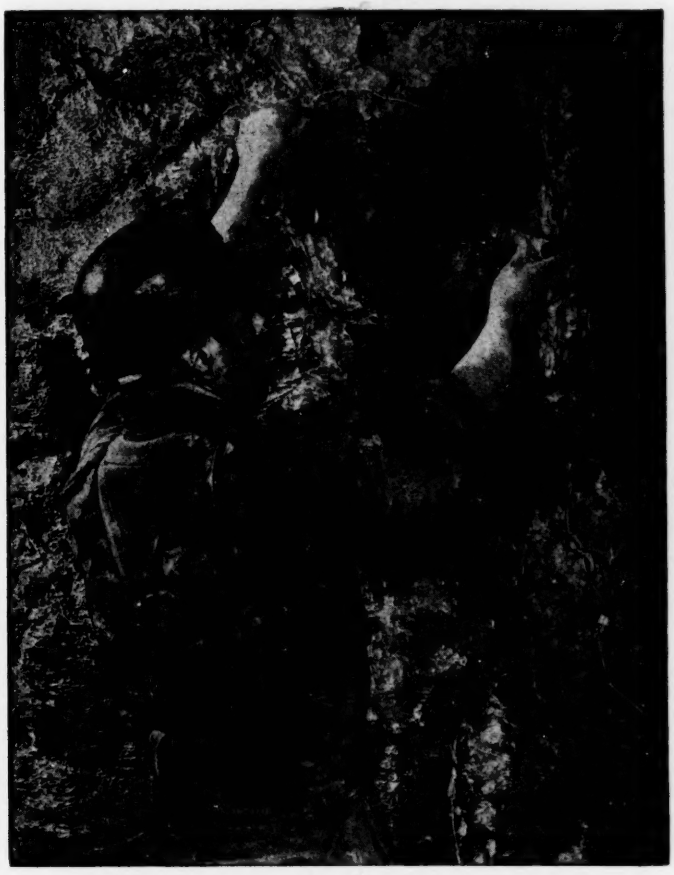

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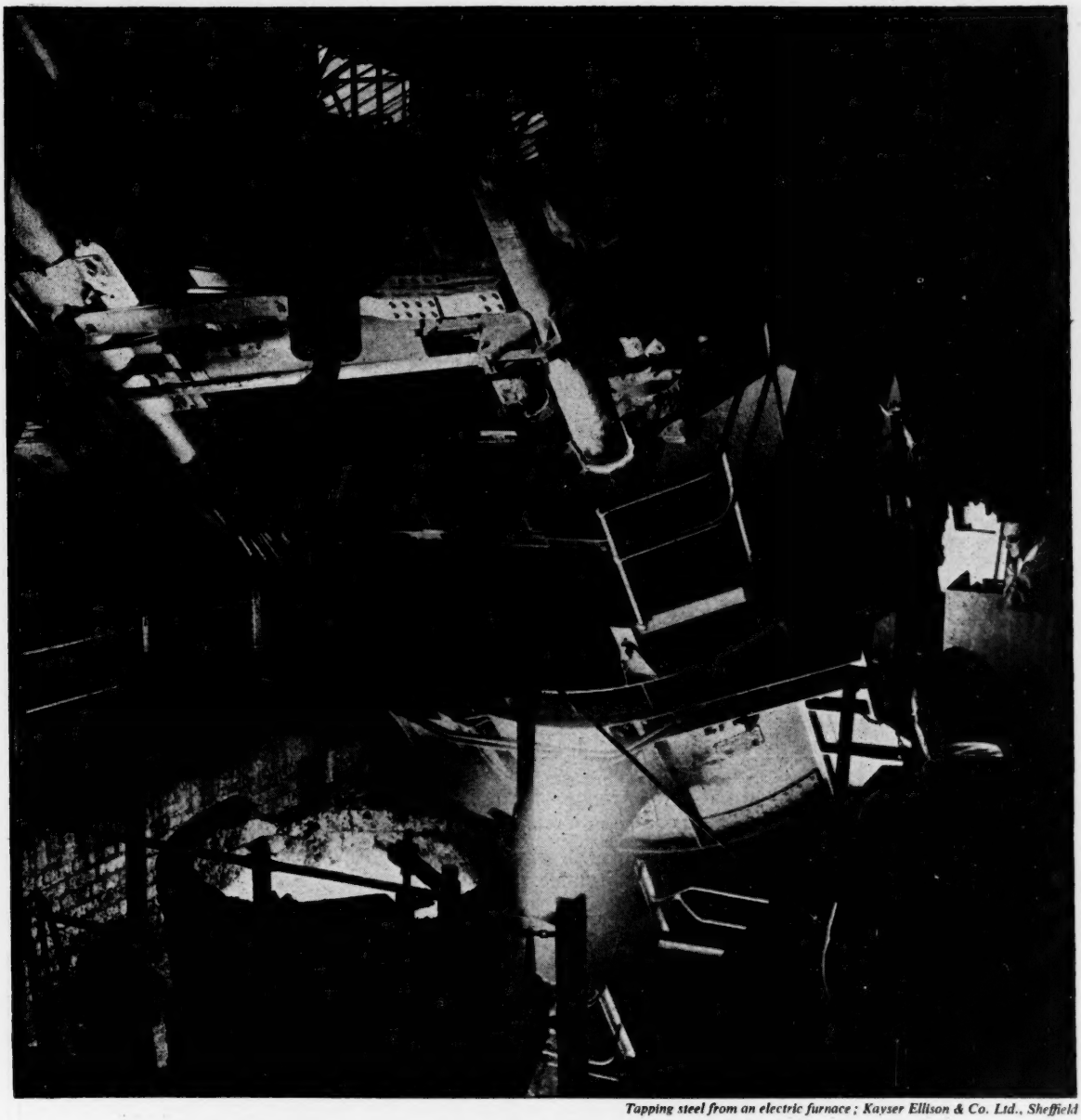

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NOTES AND COMMENTS

The Battle of the Gap

While the struggle to remedy a continuance of the adverse balance of trade for Great Britain, and to a considerable extent of the Commonwealth generally, has been as Mr. Butler pointed out on Monday, encouraging, overseas figures for June reveal a further rise in the trade deficit which was £79,700,000, as compared with £76,800,000 in May and £69,600,000 in April. Too much importance cannot be attached to monthly fluctuations, but this trend in the second quarter of the year warns us that we are still by no means out of the wood, and the Chancellor has once again emphasized that the general trade position is not yet satisfactory and it is essential that there should be a better drive for exports. Either, as Mr. R. S. Harrod put it in his recent study of "The Imbalance of International Payments," published in the April issue of *International Monetary Fund Staff Papers*, the rest of the world will have to find acceptable goods to send to the United States in lieu of gold, or alternatively, will have to buy correspondingly less from the United States.

Thus the question of revaluing gold to correspond to the rise in dollar prices of goods entering international trade, which he puts at some two and a half times, is presenting itself with increased urgency. In this connection our Canadian correspondent has written to us showing how thought in America is moving.

"Gold is expected to become the subject of detailed discussion at the annual meeting of the governors of the International Monetary Fund scheduled to be held in Washington on September 8. The subject was dodged at last year's meeting, but the increasing advocacy of the part the precious metal plays in world trade has appeared to render it quite imperative that the problem should now come under general and detailed discussion. The press of both Canada and the United States is leaning to an increasing extent toward the opinion that a higher price for gold is a necessity if there is to be any hope of encouraging a higher rate of output of the metal. Many observers believe the I.M.F. will continue to avoid the issue for possibly another year or two. Should business depression develop, with a serious decline in tax revenue to national treasuries, the governments of the world would be hard pressed to pay interest on vast debts and to maintain financial solvency. If such a period of distress should materialize, an increase in the price of gold would then serve as reserve ammunition in the battle against deflation and unemployment. As in 1932 an increase in the price of gold might be employed as a means of priming the pump so as to set the stream of business flowing once again. It was through such action that the United States lifted itself by its own bootstraps in the early thirties. Possibly Washington may wish to defer any increase in the price of gold against the possibility of dire necessity at some future time."

The dominating position of United States export trade is no new phenomenon. During the '20s, the United States surplus was wholly covered by the investment of U.S. capital abroad, but this, of course, ceased with the slump years from the end of 1929 and during the '30s the surplus was paid for by the great flow of gold to the States, which served to meet the imbalance in the trend of trade but at the cost of the dollar reserves in other countries. Hence, subsequent to the Second World War and the progressive diminution of "aid," the means of reducing the adverse trade balance by means of gold shipments, the means of adjustment which had served for centuries, was no longer available. Consequently, as Mr. Harrod observes, "if the dollar gap is to be closed in the near future it will mean a large curtailment of United States exports." Such a prospect projects a serious problem for the economy of the United States.

Dr. E. G. Nourse, former chairman of the Presidents' Council of Economic Advisers in a recent lecture is reported as saying, that the problem with which the U.S. is now wrestling was whether they would act with enough intelligence and possess enough technical knowledge to prevent any breakdown in the flow of goods and services. In his opinion, the U.S to-day had all the makings of a depression. In this connection it is not perhaps irrelevant to recall that the end of the fiscal year on June 30 last, according to Senator Taft, would show the U.S. with a deficit of some $9,000,000,000, or double that of the previous year, and for the present fiscal year probably at least $7,000,000,000. Moreover, the recent steps by the Federal Reserve System to free reserves, lift credit restrictions, and

facilitate instalment buying on an increased scale points to Administration anxieties in the same direction.

At this point the policy of increasing the fixed price of gold to an extent corresponding more or less to the advance in the dollar prices of goods entering international trade, takes on increasing importance, especially in view of the very strong opposition which has been displayed in the United States towards the policy of freeing imports from restrictive, or even prohibitive tariffs. As a result of his studies, Mr. Harrod reaches the conclusion that none of the shifts in individual categories of commodity trade are of comparable order of importance to a change in the gold situation. He estimates that if the value of newly mined gold available for money outside the United States and the U.S.S.R. had borne the same relation to the value of world trade as it did in the '30s, the rest of the world could have paid for the whole realized surplus of the U.S. on goods and services account in 1950 to mid-1952 without loss of reserves and without "aid." He recalled the fact often referred to in *The Mining Journal*, that, at the present value of gold in terms of goods, not all the gold in the world is sufficient to provide nations with adequate reserves and he refers to a widespread belief that the world gold shortage was in part responsible for the 1929 and subsequent world slump.

Despite the promise of the new Orange Free State goldfields there is little to suggest that the world gold output promises any very considerable increase, so far as can be judged at the present time. The superior attractions of base metal mining, with the enormous increases in prices witnessed since 1950, tended to divert investment in gold mines to older base metals as well as to newcomers among the industrial metals. The radical readjustment in values now being witnessed may tend to readjust the balance to some extent, but were we to have a revaluation of gold, the effect on the distribution of investment money might make a profound revolution in the pattern of mining. Our Canadian correspondent does not anticipate that this is likely to happen in the near future, but events seem to us to be moving gradually, if slowly, in that direction.

Killing the Goose

In his speech last week at the annual meeting of the Selection Trust Mr. A. Chester Beatty, Jr., reverted, as we have so often found it necessary to do in these columns, to the dismal plight to which London is gradually being reduced in comparison with its erstwhile pre-eminence as the world's mining-finance centre. Readers will recall the statement made recently by the President of the Institution of Mining and Metallurgy to the effect that not a single mining company has been registered in Great Britain since 1939 for the purpose of developing an overseas mining proposition. The contrast of this state of affairs with the activity of the London capital mining market in the late '30s is even more startling when it is recalled that in the five year period prior to World War II over £100,000,000 was raised in London for mining companies directed and financed from the City, a figure which might perhaps be doubled in terms of corresponding present day values.

The particular service which Mr. Chester Beatty rendered in his speech last week was to emphasize two damaging consequences for the British economy, which must become increasingly apparent as mining financial control continues to drift away from London. Of these, the first is the increasing loss of control over the destination of essential raw materials produced in areas where, were it not for this country's penal fiscal policy, London might reasonably expect to be exercising financial control over the means of production. The prospect should be vastly disturbing to any Government of this country "whose life blood," in the words of Mr. Chester Beatty, "is a supply of raw materials to turn into exports," and which, we might add, must be faced in the future with increasing competition from the United States in the bid for raw materials from underdeveloped areas.

The second consequence, which is of much more immediate importance, bears directly on the drive for exports of plant and machinery upon which so much official emphasis is currently being placed. As Mr. Chester Beatty points out, a mining house administered from London is in practice somewhat in the position of a tied house in that it would naturally tend to purchase plant and stores and engage personnel from this country. Inevitably the progressive shift away from London of the centre of financial influence, if not in every case of control, places our own plant and machinery manufacturers at a seemingly unnecessary disadvantage. Incidentally, it should be remembered that the danger here is not merely in loss of financial control, but also in the tendency for the staffing of such mines to be increasingly handed over to non-British personnel whose previous business contacts will, in many cases, have been with non-British manufacturers.

The remedy for this state of affairs lies largely in the realms of fiscal reform, with the nature of which *Mining Journal* readers are already too familiar for us to need to restate it here. Admittedly this year's Budget has introduced some measure of relief, although this has mainly had the effect of redistributing the incidence of tax liability over the year rather than providing any exceptional overall tax relief. Why, however, successive Governments, of the Left and of the Right alike, have made no really determined attempt to deal with the problem may well provide future historians with fruitless speculation. For the moment it can only appear to contemporary observers that the Treasury's fear of appearing to discriminate in favour of one section of the industrial community is threatening unnecessary hardship for the community as a whole.

Steel Denationalization

"D Day" for steel was uneventful. Denationalization of the industry will be a slow process. Negotiations for the disposal of the assets of seven companies—Colvilles, Dorman Longs, Lancashire Steel, Stewart and Lloyds, John Summers, United Steel, and Whitehead Iron—are well advanced but the first public share offer is not expected before September and the bargaining for other plants may be much more protracted.

Meanwhile, the production record of the industry in the first half of this year has evoked well deserved encomiums. In spite of the effect of the Coronation, steel output last month was an all time record for June and the aggregate output for the half year exceeded 9,000,000 tons, the official figure being 9,037,700 tons. There is now every prospect that the steel industry will exceed its own forecast of a total output of 17,500,000 tons in 1953. On the other hand production of the six countries affiliated to the European Coal and Steel Pool is slumping. German steel output during the first six months of 1953 fell short of 8,000,000 tons and it is now reasonably certain that the target figure of 18,000,000 tons will not be attained.

The one disappointment in the record of British steel in 1953 is the sluggish state of the export trade. There has been no improvement on the 1952 figures. Efforts to expand the volume of overseas trade are to be intensified and it would create no surprise if the export premiums were modified or cancelled out entirely. Indeed, it is understood that the export prices of small bars are already under review and the new Iron and Steel Board, which is invested with complete control of selling prices, may take an early opportunity to review also the fixed maximum home prices in the light of altered circumstances. There are now no serious shortages apart from plates and buyers are

adopting a more cautious policy in regard to future commitments. There is still, however, a healthy home demand and makers have impressive tonnages on their books.

Pig iron production reached an annual rate of 11,100,000 tons in the first six months of this year compared with 10,400,000 tons last year, with an expected total of 11,700,000 tons for the whole year. The further expansion of pig iron production remains an urgent need, but the position is easier than it might have been because of the marked improvement in the deliveries of home and foreign scrap. These have exceeded the highest anticipations and stocks have more than doubled in the last 12 months.

Geological Survey of Canada in 1953

It has been announced by Mr. Prudham, Canadian Minister of Mines and Technical Surveys, that the Geological Survey of Canada will this year place 77 parties in the field. This number is identical to that utilized last year, and their task will be to carry out investigations and mapping activities in all provinces and in Yukon and Northwest Territories. The projects to be undertaken include an aerial reconnaissance by "conventional aircraft" in northern Ungava that will cover the northern continuation of the Quebec-Labrador iron belt, detailed mapping in the Canal Flats area of British Columbia to shed light on the structure and origin of the Rocky Mountain Trench which is one of the outstanding geological features of the province, and the investigation of a folded belt of metamorphic rocks in northern Ellesmere Island, less than 500 miles from the North Pole.

Previous mention has been made in *The Mining Journal* of aerial survey work in Canada, and of Operation Keewatin, which is to be continued in a northerly direction. Of the operating parties in the field this summer, seven have been assigned to geological reconnaissance in little-known regions of the Yukon, Northwest Territories and Quebec, while a further 19 parties will map geologically at one inch to four mile scale favourable areas in Newfoundland, Quebec, Manitoba, British Columbia and Yukon. Nineteen other parties will prepare detailed maps of areas throughout Canada which are of special geological interest or which are presented as potential sources of base metals, iron, uranium, or the mineral fuels.

Other parties in differing strengths are to be engaged in stratigraphic, palaeontological and special studies in areas stretching the breadth of Canada.

Brazil

(From Our Own Correspondent)

Teresopolis, July 5.

The Brazilian Government is being insistently urged to promote mineral activities and exports. The Sao Paulo Federation of Industries, in a memorandum to President Vargas, suggests that, within 20 years, the mineral production of industrial countries will undergo profound changes and only those with adequate reserves will be able to maintain industrial activities at the level of national needs. The United States, whose mineral production is valued at £5,000,000,000, is only self-sufficient in respect of nine minerals and must import 23, including chromium. Within 20 years consumption of chromium is expected to increase 90 per cent; aluminium 400 per cent; magnesium 200 per cent; tungsten 150 per cent; iron, zinc, lead and fuels 50 per cent; copper 50 per cent. U.S. deposits of copper, lead and zinc are only sufficient for 40 years and other Western industrial nations are in a worse position. Brazil has great possibilities, but the full extent of her mineral reserves is unknown. Prospecting, well directed, will prove a highly lucrative investment and prospects for exports are now excellent.

The memorandum suggests measures to increase production and exports.

MEASURES TO INCREASE OUTPUT

An investment of U.S. $17,000,000 will boost export capacity of the Itabira iron mines to 3,000,000 tons, while U.S. $25,000,000 spent on the projected Itacurussa port and railway (see *The Mining Journal*, September 24, 1949), will allow shipment of 10,000,000 tons from central Minas Geraes.

Minas Geraes has reserves of 7,000,000 tons of manganese, Urucum 30,000,000 and Amapá 20,000,000. Assuming consumption to be at the rate of 0.65 per cent per ton of steel, Brazil requires 80,000 tons annually, with an average Mn content of 44 per cent. When exports from Urucum and Amapá become available Minas Geraes ore should be retained for local use. Until then exports should be limited to 250,000 tons annually, but the price should not be less than U.S. $40 per ton.

The memorandum then proceeds to indicate the possibility, based on war-time sales, of increasing exports of tungsten, mica, chromium and titanium ores, tantalite, quartz and zirconium. Properly exploited these should yield U.S. $25,000,000 annually. As regards diamonds the Federation points out that in 1943, when exports were properly controlled, the value of shipments was ten times higher than after the war, although prices had increased and mining activities had continued unabated. The trade in diamonds and semi-precious stones seems to be largely clandestine.

LONG TERM PLANS

As regards long-term plans, the memorandum recommends revising the Code of Mines and creating a Department of Mineral Research and a Bureau of Mines, the latter to control prices and implant modern mining and industrial processes. Special measures should be adopted to increase production of copper in Bahia and Rio Grande do Sul; nickel in Goias; tin in Minas Geraes and Amapá; lead in Sao Paulo, Minas Geraes, Bahia, Paraná and Santa Catarina; zinc in Minas Geraes and Bahia.

The recommendations of the Federation of Industries follow closely those of Professor Mehl's report to the Brazil-United States Commission for Economic Development. The Professor considers that, in view of the possibilities of expansion and the growing world demand, Brazil's deposits of chromite, nickel, tungsten, cobalt, copper, lead, zinc and tin should be thoroughly investigated with the least possible delay. The chromium ores in Minas Geraes and Bahia, estimated at 500,000 tons, should be studied and the quantities of metallurgic and chemical chromite defined (the U.S.A. market absorbs 1,200,000 tons of chromium annually, of which 99 per cent is imported). When developed, the nickel ores of Sao José de Tocantins (Goias), amounting probably to 20,000,000 tons, with 2 per cent metallic nickel, and others in Minas Geraes, will supply Brazil's needs, the surplus finding a ready market abroad. The abundant tungsten ores of north-east Brazil should be re-examined and mining processes modernized. Prospecting, drilling and analysis of the Aquidauna (Mato Grosso) cobalt deposits, owing to the world shortage, should not be delayed, and every effort should be made to increase the known reserves of copper, lead, zinc and tin and to discover new occurrences.

[A Reuter cable from Rio de Janeiro this week says: Deposits of ores of important metals have been discovered in the Brazilian State of Para, it is reported here. Preliminary analyses carried out by the Sao Paulo Institute for Technological Research show that they contain titanium, barium, zirconium, and vanadium. The location of the deposits has not been disclosed.—Ed. *M.J.*]

Canada

(From Our Own Correspondent)

Cobalt, July 7.

The town of Cobalt, cradle of successful precious metal mining in middle Canada, is celebrating its 50th anniversary this week. An "Old Boys' Reunion" is taking place where pioneers are gathered together to revisit the trails of their past and to recount the glories that marked the early years of this fabulous native silver mining field. It was in 1903 that J. H. McKinley and Ernest F. Darragh made the first discoveries of silver at Cobalt, and recorded their mining claim August 14. They were engaged in cutting ties for use on construction of the Temiskaming and Northern Ontario Railway, and knew little or nothing about rocks or minerals. It was not until the spring of 1904 that they undertook further exploration of their find.

Meanwhile, Fred LaRose, a blacksmith employed on railway construction, made a discovery and recorded his claim September 29, 1903. The third discovery was made by Tom Herbert who recorded his claim October 22, 1903. It was Arthur Ferland of the nearby village of Haileybury who sent the first specimens to the Ontario Bureau of Mines, with the suggestion that he believed the discovery warranted a visit to the field by a provincial government geologist. As a result, Willet G. Miller, geologist, accompanied by Cyril W. Knight and R. Anson-Cartwright as assistants, were sent to the scene of the silver find in November, 1903. Slow to realize the magnitude of what was in course of being revealed at Cobalt, it was not until 1905 that the T. and N. O. Railway sold at auction a first block of lots on its townsite. It was not until December 1906, that the town of Cobalt was incorporated, with P. J. Finlan elected mayor. From that time on, the field experienced the most spectacular boom in the history of mining in Canada up to that time.

EARLY JOURNALISM IN COBALT

It was in 1908 that the Canadian staff correspondent of *The Mining Journal* was attracted to Cobalt from the mining fields of East Kootenay in British Columbia. It was the riches of Cobalt that served as the springboard for prospectors who trekked further north and in 1909 discovered the rich gold field of Porcupine just 100 miles away, as well as the Kirkland Lake gold field in 1911, followed by other outstanding discoveries in Ontario as well as Rouyn in Quebec and Flin-Flon in Manitoba. It was in Cobalt where *The Cobalt Daily Nugget* was published; and it was at Cobalt where *The Northern Miner* was founded, as well as *The Mining Review*. Unfolded now before *The Mining Journal* representative as he writes is a copy of *The Mining Review*, dated May 31, 1918—somewhat faded and yellow with the passing of 35 years—and on the editorial page is this heading:

THE MINING REVIEW

A weekly newspaper devoted to the mining news of Northern Ontario's Silver and Gold Camps, and the mining industry in general.

Published at Cobalt, Ont., every Friday, by *The Cobalt Daily Nugget*, Limited; Jas. A. McRae, Editor.

Here in Cobalt in the reunion of July 5 to 11, 1953, an exceedingly able effort has been made to depict some of the pictures of the past. Visitors are here from the various mining fields spread out across 4,000 miles of Canada from coast to coast. The "Old Timers" are striving hard to meet the challenge of time and to muster some of the spirit of old—but it is but a smoulder of the fires of old—and most are content to gaze upon the cooling embers and to merely reminisce.

Gold holdings by the Canadian Government are believed to have risen to almost $1,000,000,000, a new high record. The records suggest Ottawa is favouring the holding of gold in preference to American dollars. At May 31, Canada's gold holdings were $923,000,000 while American funds held in the Exchange Fund Account were $838,200,000.

Campaigning in the Canadian general election scheduled for August 10 is swinging into high gear. The Liberal Government now in office is going to the country on its past performance and with the inference that the people were never more prosperous. The Conservative opposition is appealing to the electorate with a plan to reduce expenditures and to pass on an estimated annual saving of $500,000,000 as a tax reduction, to reverse the trend of centralization of power at Ottawa, and to return greater power to individual provincial governments; it is urging too that a greater percentage of Canada's iron ore production should be processed here.

NICKEL PRODUCTION

The new railway to the Lynn Lake nickel mine of Sherritt-Gordon is nearing completion. Regular train service is expected to be established by early November. It is planned to have the mine itself in production some time in October. Meanwhile the company's nickel refinery in Saskatchewan is scheduled for completion by Christmas. In the interval between commencement of production at the mine in Manitoba and completion of the refinery in Saskatchewan, the copper concentrates will be shipped to Noranda in Quebec and the nickel concentrates will be sent to Fort Saskatchewan for storage pending commencement of operation of the refinery there.

A new nickel producing mine is in the making on the west coast of Hudson's Bay. Rankin Inlet Nickel Mines has indicated 435,000 tons of ore containing 3.29 per cent nickel. The company has raised an additional $900,000 with which to carry out a development programme extending through 1954. Shaft sinking has comenced, the opening being just 300 ft. from tidewater. The first stage of development will be levels at 150 ft. and 300 ft. in depth.

THE BATHURST DISTRICT

The Bathurst mining district of New Brunswick is developing every indication of rising to a place among the important mining fields of Canada. Brunswick Mining and Smelting Co., and the joint operation of Anacon and Leadridge are the two major enterprises, but with a number of additional prospects of considerable promise. Exploration and development is centred largely in a radius of about 20 miles west and north of Bathurst.

Another pipeline for carrying petroleum from Alberta and Saskatchewan to the industrial centres of eastern Canada is being advocated. An all Canadian route is strongly favoured in preference to the present line which passes in part through the United States. The cost of an all Canadian route would be more, but would be expected to contribute materially to industrial development in northern Canada.

Iron ore has risen to $9.90 per ton for 51.5 per cent grade, with bessemer commanding $10.05 and with $11.15 per ton for open hearth lump. This demand is working to the advantage of the iron fields at Steep Rock and Michipicoten in Ontario and for the big new iron resources of Northern Quebec and Labrador.

Petroleum output in Canada for the second quarter of 1953 was 15,053,000 bbls. compared with 11,030,000 in the corresponding period of 1952. Gold output increased 8 per cent, copper increased 5 per cent, lead increased 21.4 per cent, zinc increased 19 per cent, silver 21.8 per cent, natural gas 7.7 per cent and nickel 1.6 per cent.

PLANNING SHAFT WINDING EQUIPMENT AND SURFACE LAYOUT—I

Shaft Design and Choice of Winding Equipment at Ruhr Collieries

Although the following article, the first of two instalments, lays particular emphasis on collieries in the Ruhr, the practices described are obviously of widespread application and should be of interest in mining circles beyond the coal industry. The article is a condensation of a paper entitled "The Planning of Shaft-Winding Equipment as a Basis for the Construction of Surface Plant at Collieries in the Ruhr" by Dr.-Ing. Herman Schäfer, V.D.I., V.D.E.R., technical director of Gutehoffnungshütte at Oberhausen-Sterkrade, which was presented at the one hundred and eleventh general meeting of the Institution of Mining Engineers held at the University of Manchester this week. The portions of Dr. Schäfer's paper reproduced below are concerned primarily with underground problems of shaft design and the choice of winding equipment. The remainder of the paper, which will appear in a later issue, deals with the influence of the planning of the shaft-winding plant upon the surface plant layout.

The depth of winding shafts varies as the cover increases and the coal winning descends to greater depths. It is a decisive factor for determining the dimensions of the shaft-winding plants as well as the tonnage to be wound. In the Ruhr district the depth of the shafts averages approximately 760 m. (2,496 ft.). The rapid increase by some 6 m. 19.8 ft.) per year on this figure is, among other things, due to the lack of new winding plants. To replace the exhausted coal mines of the southern Ruhr one new colliery should come into existence each year in the north of the Ruhr district. For some ten years this development has been held up, and the last new collieries started about ten years ago have not been fully completed so far, while some of them are not yet raising coal.

TREND TOWARDS FEWER SHAFTS

In the northern Ruhr district the new collieries descend to steadily increasing depths so that planning work for such coal mines has to consider definite depths which are as great as 1,200 or 1,400 m. (3,930 or 4,590 ft.). Sometimes these shafts demand much capital and the other overhead costs increase so that it becomes necesasry to attain a tonnage wound per day which ensures that the selling price of the coal will be competitive. These considerations lead to the construction of shaft-winding plants which go down to great depths and which raise large tonnages per hour. The trend of this development during the years 1920-1952 showed that the number of the shaft-winding plants decreases as the depth of the shafts increases, and at the same time the tonnage wound per working day increases in the Ruhr district. In 1929, the average tonnage raised per shaft-winding plant per day was 2,200 tons, rising to 3,100 tons per day in 1939. To-day this figure is approximately 3,300 tons per day. The new collieries at present under construction in the Rhenish-Westfalian coal mining district have been laid out for a production of 8,000 to 10,000 tons per day. Recently it was proposed to build shaft-winding plants which would be capable of raising 16,000 to 20,000 tons per day, in order that the selling price of the coal may be fixed as a result of comparatively low overhead costs.

In 1946 the average coal-raising capacity of the various shaft-winding plants, computed for 348 shafts, amounted according to *Glebe*, to 172 tons per hour. From this figure the total capacity for all the winding shafts is 59,850 tons per hour, or 718,000 tons per day if winding continues for 12 hours per day. At present, however, the tonnage raised per day actually averages only some 420,000 to 440,000 tons.

The tendency towards raising large tonnages of coal is revealed in the new shaft-winding plants under construction or in those which are now being planned. They are being designed and laid out for tonnages of 400 to 500 tons per hour, and besides raising these large tonnages of coal, these shafts have also to transport the miners, material and stone.

The more efficiently the planning engineer succeeds in separating these different items from each other, either as to time or location, the greater will be the simplicity with which winding can be carried out. This aspect again, will greatly simplify the plant and will allow mechanization of it in part, or in the whole. It will, therefore, be important to build plants which are restricted to single operations wherever possible, and not to concentrate all the various items for transport in the same winding plant. It may be necessary to compromise, for instance, if the coal winding system be required also for man-riding.

However, it should be a general rule to restrict man-riding and the transportation of material to separate shafts, and the transportation of rock should not influence the flow of the coal winding.

MAXIMUM UTILIZATION OF SHAFT AREA

The shaft diameter is directly determined by the depth to be attained and by the tonnage to be wound. In spite of the endeavours to maintain the figure of 6.5 m. (21.3 ft.) as the upper limit for shaft diameters, the necessity of using larger diameters when planning new large-sized plants arises with increasing frequence. As the costs of the shafts increase considerably as their diameters increase—and this is particularly true when shaft sinking by the freezing process—it becomes necessary to utilize the available shaft section as profitably as possible. The ratio which exists between the utilized shaft section and the total shaft section may serve as a measure for checking whether the shaft section has been utilized profitably or not.

By fixing standards for subdividing the shaft sections with a view to ensuring the most advantageous conditions, the coal mining industry of the Ruhr district is endeavouring generally to strive for a profitable utilization of the shaft sections and, simultaneously, to establish a basis for standardized dimensions of the equipment in and for the shafts. The shaft sections have been developed to fit in with existing standardized mine cars; in doing so, provisions have also been made for using skips instead of cages.

IMPORTANCE OF SHAFT GUIDES

The need to utilize the shaft sections as profitably as possible also renders it necessary to adopt rigid guides in the shafts in order to minimize the distance between the cages or skips, and also between the cages or skips and the sides of the shafts. Often it will be necessary for the rigid guides to follow the deflections of the shafts (which may become out of alignment owing to the effects of extraction), as otherwise the cages or skips would conctact the wall of the shafts if guided truly perpendicularly. The result is

that the winding operation cannot always continue in the manner originally designed. For various reasons the rigid wooden guides holding the cages or skips at their front ends are much preferred by the coal mining industry of the Ruhr district. The greater the depths, the more it has proved necessary to pay attention to the horizontal impact forces which occur on rigid guides

It is impossible to determine the horizontal impact forces by mere theoretical computation. Hence a measuring instrument—a measuring guide shoe—was developed, which for the first time enabled measurement to be made of the effect of the horizontal impact forces acting upon the front side of the wooden guide beams. The results of the measurement of the impact forces taken in the same shaft compartment, and with the conditions of the guides similar throughout, first on the cage-winding system and thereafter on the skip-winding system, showed that the horizontal impact forces were 100 per cent higher in the skip than in the cage system. It is evident from a study of the measurements that the impact forces which occur at the joints of the guides increase with the winding speed.

For reducing these impact forces which also adversely affect the winding rope, the guide beams have to be fitted with the utmost precision and with due regard to the prescribed allowances. It is recommended that an adjustment should be made over distances of 5 m. (16.4 ft.) for every 10 mm. (0.394 in.) discrepancy between adjacent guides. Another expedient for reducing the impact forces is the installation of sprung guide shoes (the spring deflection and final springing power of which have to be accurately determined).

For reducing the wear and tear of the guides it is advisable to substitute the rolling friction of guide rollers equipped with pneumatic tyres for the sliding friction of the guide shoes. The improvement thus effected includes the additional advantage that lubrication of the guides is no longer a requisite.

Where ropes are used as guides there is no problem of horizontal shocks and the expenses in connection with the shaft equipment are considerably less. In addition, there is less resistance to ventilation in the shaft owing to the absence of the buntons. The clearances to be provided between the cages or skips and similarly between the sides of the shafts require particular attention in the case of rope guides if the shafts are out of the vertical or if, owing to the great depth of a shaft, the guide ropes portray a tendency to whip, thus requiring heavy stretching weights.

CAGE VERSUS SKIP-WINDING

Discussion regarding the advantages and disadvantages of the cage and skip winding systems has never ceased. A general judgment is scarcely possible in this matter, as existing conditions may influence the choice of either one of the two systems.

The majority of the shaft-winding plants in the Ruhr district have cage-winding systems which were designed and constructed with due consideration of the mine cars or tubs in use. From this fact it may be realized how important is the mine car for the work of planning a shaft-winding plant and even a whole colliery. For this reason the problem of standardizing the mine cars was tackled in spite of all difficulties. As far as tubs of a capacity of up to, say, 1,500 litres (53 cu. ft.) are concerned, this standardization was restricted to the basic structural components of the numerous types of cars, i.e. to fix basic standard parts which can be used for the construction of tubs of the size required in each individual case. On the other hand, for mine cars of medium and large capacity the dimensions have been standardized for only a few basic types, while the details of the component parts are left to the discretion of the designer. This, in conjunction with due consideration of the shaft conditions, led to the development of six basic types of cars, the capacities of which vary between 1,600 and 5,000 litres (56.5 and 177 cu. ft.). These can be used in every case where conditions are normal.

According to the tonnage raised and thus the required useful load, the size of the mine cars has to be chosen with due regard to underground conditions and to the number of cage decks. In former times cages with one to six decks or more were in use, each deck taking one, two, three, or four cars. For new winding plants, however, the present tendency is to equip the cages with not more than four decks and for each deck to take a maximum of two cars. Thus one cage takes either four or eight mine cars. As the sound principle is to use mine cars of as large a capacity as practice permits in the mine, an attempt will always be made to suffice with four mine cars, one on each of the four separate decks, where the cage-winding system is operative.

The up-to-date cage-winding plants for large-capacity mine cars of, say, three, four, or even 5 cu. m. (106, 141, or even 177 cu. ft.) each are, so far as the dead load is concerned, no less economic than a skip-winding plant of the same capacity and which is equipped with two man-riding decks.

ADVANTAGES OF SKIP-WINDING

The essential advantage of the skip-winding system as compared with the cage-winding system for the same useful load, lies in the fact that owing to the short winding intervals a higher output is attainable. This explains the reason why 16 skip-winding systems installed in main shafts are now in full operation in the Ruhr district, while yet another five such systems are under construction.

Certain advantages of the system are : (i) simple surface equipment with belt conveyors leading up to the coal preparation plant ; (ii) the mine cars are independent of the shaft-winding system ; (iii) simple design of the shaft inset equipment due to the use of continuous-weighing belt conveyors ; and (iv) complete mechanization of the shaft-winding operations. If it be remembered that further progress may be anticipated in the field of utilizing the coal as a raw material for chemical products and of utilizing low-grade coal for power generation, it is evident that there are still many possible applications for the skip-winding system.

The winding speed of the cage and skip-winding systems is limited to 20 m. per sec. (65.6 ft. per sec.) by the mine Regulations as far as the winding of mineral is concerned. In view of the steadily increasing difficulties encountered in deep shafts (more than 1,000 m.) (3,282 ft.) with rigid guides, it will in future be necessary to adopt lower speeds and to increase the useful loads accordingly.

If heavier loads are raised at lower speeds, this will, it is true, slightly diminish the superiority of the skip winding system over the cage winding system, but it will not fundamentally change the general opinion in this respect.

WINDING EQUIPMENTS

The increases in the tonnages of coal wound are clearly reflected in the development of the winder, since the first steam winder was commissioned in the Ruhr district 125 years ago. Average depth has increased to 760 m. (2,496 ft.), of which 30 winds per hour raise 200 to 300 tons of coal at a winding speed of approximately 16 m. per sec. (52.5 ft. per sec.). The work performed per hour and expressed in useful ton-kilometres has risen from 0.785-1.01 to 152-228 (or 860-1,100 to 166,000-250,000 metric ton-yds.).

When the electric drive entered the field, the electric winder progressed in parallel with the steam winder so that to-day, from the technical view point, the steam winder and the electric winder are equivalent prime movers and

the question as to which of these winders should be preferred has to be decided according to the prevailing conditions in each case. In the Ruhr district to-day, so far as main shafts are concerned, electric and steam winders are in the proportion of 1 : 4, but this figure will be reversed more and more as new winding plants are commissioned.

The design and construction of the winding-rope carriers was originally planned in order to keep the static moments during the winds as constant as possible, by changing the length of the lever arm. When the shafts began to reach depths of more than 500 m. (1,641 ft.), the conical drums in the Ruhr district were replaced by cylindrical drums. Although this change meant renouncing the possibility of compensating the rope loads by the use of steadily increasing or decreasing coiling diameters, it was considered advisable to do so, as otherwise the differences in the coiling diameters would become too great when using conical drums.

The heavy masses of the drums, which are mostly of the radially adjustable type, and the coiling lengths which are dependent on the length and diameter of the winding ropes, demand great accelerating and braking forces; long shafts; wide foundations; and large engine houses.

THE KOEPE PULLEY

It was in Germany that these difficulties first led to the use of the driving or Koepe pulley. This pulley transmits the power to the winding rope entirely by friction, and requires the use of a tail or balance rope in order to compensate for the weight of the winding rope.

The introduction of the Koepe winding system created the necessity of planning coal winding from central points or shaft insets, capable of handling large tonnages. With the Koepe winding system it is only possible to utilize both cages or skips when raising mineral from one level. Where it is intended to raise the coal from two different levels, it is practicable to install two winding systems in one shaft.

In Germany and in the Netherlands already 90 per cent of all the shaft-winding plants have Koepe pulley drives and use is made of swinging platforms for the decking operations at the surface and underground. The platforms allow rapid changing of the decks so that it has proved necessary only in particular cases to use two decks of the cages simultaneously.

The development of the winding ropes has been largely influenced by the type and character of the winding-rope carrier. The drum winding system demands a rope diameter as small as possible in order to ensure that a great length of rope can be coiled within a narrow space, but with the Koepe winding system the diameter of the rope is not so important. The demand for a small rope diameter imposes the condition that the metallic cross-section of the rope should be as large as possible for a determined diameter, a condition which leads to the development of locked coil winding ropes made of wires having a high tensile strength. In comparison, and in the country where the Koepe pulley was developed, the unlocked stranded rope, the wires for which the mine Regulations fixed an upper limit of tensile strength, has found a wide field of application.

DETERMINATION OF ROPE SIZE

For determining the size of the winding rope, use is made of the theoretical breaking load of the rope which is the product of its metallic cross-section and of the chosen tensile strength of the wires. In the case of the Koepe winding system the safety factor of the rope against breakage must be at least 7 when minerals are wound, and at least 9.5 in the case of man-riding. These safety factors are to cover the loads which cannot be determined theoretically, but the rope diameter, i.e. the metallic cross-section required for carrying the working load will, of course, increase when mining descends to greater depths.

The vital question in connection with the multiple-rope winding system is, however, the technical solution to the problem of the rope compensators. One thing necessary is the measuring of the rope forces by means of special dynamometers developed for this particular purpose; and when unequal rope loads are ascertained, these will be equalized manually by changing the positions of the intermediate adjusting pieces in the rapidly adjustable intermediate rope gear.

THE DYNAMOMETER

The dynamometer consists of a slotted annular body exposed to compression. Lead blocks are inserted into the mouth of the slotted-ring dynamometer; the amount of compression suffered by these lead blocks serves to determine the maximum rope loads by means of the calibrating curves. These rope forces, determined by measuring the lead blocks, include the additional dynamic loads which occur during operation.

For the single-rope winding system, these dynamic rope forces were determined by measurements and computation to be equal to 15 per cent of the working load in the case of vibrations resulting from resonance, and to 50 per cent in the case of rope vibrations; the driving pulley being firmly braked. In consideration of the additional rope loads determined for single-rope winding systems, the additional forces present in the four-rope winding system are within normal limits.

In addition to the measurements made on the lead blocks—as explained above—it was also possible to record the changes in the rope tension during the wind by means of recording instruments, in order to ascertain the maximum rope loads occurring during winding and whether sudden changes in the rope tension occur, from which rope slip on the driving pulley might be concluded. Experiments proved that it is evident that the measured rope tension is not subject to any sudden changes. This ensures that the rope does not slip on the driving pulley.

In the Koepe winding system the balance rope serves to compensate for the weight of the winding rope. As for the tail or balance ropes, it is now generally customary to use flat ropes. In cases where the installation of one tail rope proves to be cumbersome, it is possible to use two tail or balance ropes.

SHAFT AIR RESISTANCES

The pressure-drop to be maintained by the mine fan serves to move the air through the mine and depends on the circuit followed by the air current. This circuit is split up into two main groups: these are represented, for the one part, by the downcast and the upcast shafts, and by the widely spread and sometimes complicated mine workings for the other. While the velocity of the air is rather low in the underground workings, it is high in the shafts themselves. Where the shafts are deep, 50 per cent and more of the total pressure-drop is due to the shafts themselves.

Accordingly, the effect of different shaft fittings on the air resistance was examined by means of models. With all fittings installed, the resistance was found to be 11.7 times higher than in the case of a technically smooth tube and in a shaft with uneven walls it would be approximately five times the resistance of a shaft without fittings. The most outstanding result of these experiments is the fact that smooth airtight lagging between the buntons is an efficient means of reducing the air resistance. Generally it is not necessary to consider the compressed-air, water and other piping or the electric cables in the shaft when designing the winding equipment.

ASIA'S MINERAL RESOURCES—III

Bauxite and Aluminium in Asia and the Far East

The following article is the third of a series devoted to the mineral resources of Asia and the Far East. Aluminium production in the region is at present confined to Japan, China and India. The current production is about 60,000 tons annually, of which more half comes from Japan. The Executive Secretary of E.C.A.F.E. points out that the existence in a country of mineral raw materials alone does not necessarily mean that processing and fabrication factories using these minerals could immediately be established. In the case of aluminium, for instance, a cheap and steady supply of power is a pre-requisite, the source of supply of the ore being of secondary importance. The information contained in this current article was submitted to the Regional Conference on Mineral Resource Development held in Tokyo recently under the auspices of E.C.A.F.E.

Great importance was attached by the Tokyo Conference to the development of processing industries based on bauxite and magnesite, both of which occur abundantly in Asia and the Far East. The latest estimates place the known bauxite reserves at over 900,000,000 tons, about one-third of them being high-grade. In a report presented to the Conference, the following figures were given by the Executive Secretary of E.C.A.F.E.:

	High Grade (metric tons)	*Low Grade* (metric tons)
China	600,000	631,000,000
India	250,000,000	
Indonesia	23,115,000	10,639,324
Malaya	9,000,000	
Indo-China	300,000	
	282,915,000	641,639,324

It is considered that more intensive exploration might result in further discoveries, since geological data suggest favourable conditions for the formation of bauxite in a number of areas.

CHINESE BAUXITE DEPOSITS

The first discovery of bauxite in China was made at Paoshan, Shantung Province. This occurrence has been estimated at 271,000,000 tons, but reports on the content of insoluble residue (SiO_2) are discouraging. In samples from various localities Al_2O_3 ranged from 39.79 to 59.23 Fe_2O_3 from 1.57 to 6.13, insoluble residue from 21.04 to 43.85, and matter from 13.59 to 14.95. During the war ores with 12.4 per cent SiO_2 were used in the U.S., but their treatment is too expensive for normal times.

Between 1938 and 1941, bauxite deposits were discovered in the Yunnan and Kweichow provinces in south-western China. The Yunnan reserves are estimated to be about 10,000,000 tons and those of Kweichow at 350,000,000 tons. Because of their mineral content (diaspore), which is not soluble in caustic acid solution in the standard Bayer process, they have not been used. In 1948, bauxite (gibbsite) deposits were found along the coast of Fukien province. There are indications that bauxite may also exist in the Kwantung province and Hainan Island.

Besides bauxite, large alunite deposits occur along the south-western coast and there are high-aluminium shale deposits in north-eastern China. The reserves of alunite rock are estimated at 249,900,000 metric tons containing 8,985,000 tons of extractable aluminium. The estimated total reserves of high-alumina shale are 110,000,000 tons with an alumina content of 55,000,000 tons.

China has two aluminium plants, one in Taiwan and the other in Manchuria. The Manchurian plant is located in Fushun, near Mukden. It was laid down in 1936 by the Manchurian Lignite Metal Manufacturing Company, which succeeded in making aluminium economically by the calcium-aluminate process from aluminous shale mined in Manchuria. An average output of 8,000 tons annually was maintained from 1941 until the end of the war.

Deposits of bauxite have been reported from Azad Kashmir in Koti Tehsil, Pakistan. The estimated reserves are about 2,000,000 tons of ore and in some cases the alumina content is over 70 per cent.

ALUMINIUM PRODUCTION IN INDIA

India's proved workable occurrences of bauxite are those of the Ranohi districts of Bihar, the Jabhulpore and Balaghat districts of Madhya Pradesh, Khaira, Kalaba, Kalhapur, and Belgaum in Bombay, and the Shevaroy hills of Salem in Madras. The average Indian bauxite is satisfactory in composition for the Bayer process of reduction. Analyses vary over a wide range, but many of them satisfy a minimum requirement of 52 per cent aluminium oxide and less than 5 per cent silica. India's annual production of bauxite is at present about 65,000 tons, from which about 4,000 tons of aluminium are produced per year.

Two firms in India are engaged in the production of aluminium, namely the Indian Aluminium Co. Ltd., and the Aluminium Corporation of India Ltd. The Government has included their expansion schemes in the five-year plan. These schemes aimed at increasing capacity by 2,500 tons and 500 tons per annum respectively early in 1953. The total installed capacity will increase from 4,000 tons to 7,000 tons by the end of the current year. The Indian Aluminium Co. is considering the installation of a new reduction plant at the Hirakud Dam Site with an initial annual capacity of 10,000 tons of ingots, to be increased to 20,000 tons later.

The Non-Ferrous Metals Development Committee set up by the Government of India has emphasized that the development of aluminium should be accorded a high priority. The following targets for the metal and its products have been fixed: ingots 15,000 tons annually, sheets 50,000 tons long-term and 10,000 tons short-term, foil 1,500 tons, powder 1,000 tons, wires and cables 5,000 tons, tubes and shapes 2,000 tons.

JAPANESE ACTIVITIES

In 1941, the Government of Japan sent a group of geologists to investigate the bauxite deposits of Indo-China. Deposits were located near the border of China in Tonkin State. Two producing districts, the Lang Son area near the town of Dong Dang and the Dai Phat district, were explored. Bauxite ores from both districts are similar and belong to the terra-rossa limestone type. Ore reserves in the Lang Son district are estimated at 200,000 tons of bauxite and those in the Dai Phat district at 100,000 tons.

In 1935, the Japan Aluminium Co., taking advantage of surplus electric power available in Formosa, began construction of a 12,000 ton Bayer-process alumina plant, with related aluminium reduction facilities for 6,000 tons at Takao. By early 1942 the capacity of the alumina plant had been almost tripled. Reduction facilities at Takao were also expanded, and a new plant was constructed at Karendo on the east coast of the island. Both the Takao and Karendo plants were damaged during the war.

In 1946, the Formosa Aluminium Corporation was formed under the National Resources Commission of the Chinese Government. It planned to produce 8,000 tons of aluminium ingots each year, but so far the annual production has not exceeded 4,000 tons. Before the war the Formosa plant used Bintan ore from Indonesia ; now that shipment from the Chinese mainland to Formosa is no longer possible, it buys ore from Johore, Malaya.

Aluminium works in Japan produced nearly 500,000 tons of virgin metal up to mid-1945, when all plants suspended operations. Production started again in 1948 and by 1951 the total annual output had reached 36,906 tons. The present capacity is about 45,000 tons. With the addition of new electrolysis furnaces and with the completion of repairs to existing units, it is expected to reach 85,000 tons. The Light Metal Society of Japan estimated the country's minimum requirements for the fiscal year 1952-53 at 72,500 tons, comprising 46,000 tons of primary aluminium and 26,500 tons of scrap and secondary metal.

The bauxite ore for Japan's aluminium industry has always been imported. From 1935 to 1945 imports totalled about 3,000,000 tons and from 1948 to 1951 they exceeded 600,000 tons.

Early this year it was reported that an agreement had been reached between the Japan Light Metal Co. and Alcan, whereby the former company will double its capital and Alcan will buy half the stock. The Canadian firm will advance $1,792,000 at 5.5 per cent interest, with repayment to start 3½ years later. Alcan's bauxite concessions in India and mining rights in Malaya will be included in plans for enlarging raw material supplies for the Japan Light Metal Co. Alcan will also provide technological and other assistance to develop production in Japan.

LARGE DEPOSITS IN INDONESIA

Bauxite production in Indonesia started in 1935, when 10,000 tons were mined in the island of Bintan, situated near Singapore, where the largest known deposits in South Asia are located. Output was rapidly increased, and in 1940 it amounted to 275,000 tons, which was 6-7 per cent of the world production for that year. Due to war conditions, it declined to about 180,000 tons in 1941. The pre-war output was exported mainly to Japan and also to Germany. Since the war production of Bintan bauxite has been expanded to more than 400,000 tons a year, most of which is sold to Japan and the United States.

The exploitation of these ores is undertaken by the Nederlandsch Indische Bauxite Exploitatie Maatschappij, which was founded in 1932 as a subsidiary of the Billiton Company. The deposits now being worked are situated on both sides of the Strait of Kidjang, south-east Bintan. The bauxite is mined by power shovels, the clay being washed out by a rotating sieve of 2 mm. mesh. This reduces the mean silica content, because the clay usually contains more SiO_2 than the concretions. Ore from the small islands of Kojan and Angkut is transported across the straits by a cable transport line.

The ore occurs as a superficial crust of aluminous concretions which originated through weathering of the underlying rocks. The same favourable conditions may be expected in the islands of the Riouw-Lingga Archipelago, the "tin-islands," and in the western and southern part of Borneo. There has not yet been any search for bauxite in west and south-west Borneo, but the geological conditions in this area are such that bauxite deposits similar to those of Bintan might be found. It would be much more costly, however, to transport ores from the interior of Borneo than from Bintan.

Before the war proposals were under way for establishing an aluminium industry in Indonesia with an initial capacity of about 5,000 tons a year. A start was made with the construction of a large hydro-electric plant on the Asahan River. The installations for the aluminium factories to be constructed were completed in Europe, but could not be shipped owing to the war. Recently the Government has given the matter further consideration, and the proposed plant will have an annual capacity of 10,000 tons, if established.

BAUXITE IN SOUTH MALAYA

Bauxite is of widespread occurrence in Malaya, principally in the southern half of the Peninsula, though it is only in Johore and Malacca that deposits have been worked. The mineral is formed by the weathering, under tropical conditions, of a variety of rocks. The deposits occur as superficial beds over areas of up to several thousand acres, and range in thickness from a few feet up to 25 feet.

The first mining operations in Malaya were started in 1936 at Bukit Pasir, near Batu Pahat in the State of Johore. In the following year another mine was opened up at Perigi Achih (Kim Kim) on the south coast of Johore. A third property, the Sri Medan mine near Batu Pahat, started producing in 1938. The Malayan output reached its peak in 1939 with 84,387 tons. Bulk assay figures for 1940 were 57-60 per cent Al_2O_3 at the Bukit Pasir mine, and 55-58 per cent Al_2O_3 at the Sri Medan mine.

During the Japanese occupation the production of bauxite was expanded and two new mines were opened, one at Telok Mas in Malacca and the other at Nangan in south-east Johore. Based on test pit results, the Japanese estimated the unmined reserves of the Nangan deposit at 4,000,000 tons of washed bauxite with an additional 4,000,000 tons of possible ore.

The Pendas bauxite deposit 20 miles north-west of Singapore on the southern coast of Johore has ore reserves estimated at 1,000,000 tons of bauxite. Little work has been done on this deposit. In 1952, the production of bauxite in Malaya amounted to 26,984 tons.

A deposit containing high-grade bauxite was found in 1949 during a reconnaissance by the staff of the Geological Survey Department in western Sarawak. This discovery is important, since it yields the first evidence not only that conditions suitable for the formation of high-grade aluminium ore exist in Sarawak, but that such ore has actually been formed in quantity.

At Sematan, west of Kuching, nodules of ore are scattered over an area covering approximately a third of a square mile ; samples have shown an average of over 56 per cent alumina and under 1 per cent silica contents. Other occurrences have been reported from Sarawak and it is anticipated that additional deposits will probably be found. During 1948, representatives of the British Aluminium Co. Ltd., made a reconnaissance in Sarawak, and they are now investigating the Sematan deposit.

MAGNESIUM

The Executive Secretary of E.C.A.F.E. refers in his review of mineral resources to the abundant occurrence of magnesite in the region, and the scope which exists for the manufacture of magnesium metal. There is no output of this metal in India, which is a large producer of magnesite, partly for export (mainly to Japan) and partly for the manufacture of refractory bricks. Hong Kong has a high-grade magnetite deposit at Ma-on-Shan with reserves estimated at 2-10,000,000 tons. Korea is a former producer of both aluminium and magesium with outputs of about 30,000 and 7,000 tons a year respectively.

MACHINERY AND EQUIPMENT

A Selective Mineral Jig

The basic principle of jig operation of the selective mineral jig manufactured by the Denver Equipment Co. is that of hindered settling, with the realization that to effect a concentration it is necessary there be a differential in the settling rate of the solids treated. As there is an accumulated differential in settling rates in the grinding mill discharge of a conventional closed grinding circuit, this is an ideal feed for the Denver unit. The selective jig is presented by the manufacturers as being practically automatic in operation.

The unit, built in a range of six sizes and two models, is constructed for continuous service, and the heavy frame which carries the operating mechanism is welded to the jig body and in addition is braced with gusset plates. A variation in stroke from 0 in. to ¼ in. is obtained with the adjustable eccentric. The rotating water valve for the admission of water or solution is driven through sprockets, and double roller chain from the eccentric shaft. It is synchronized with the plunger action, and through this valve water or solution is positively admitted alternatively by the two compartments. This action partially or completely kills the suction normally created on the upstroke of the plungers. The jigs are furnished with two screen compartments in the case of the duplex units and one screen compartment for the simplex unit.

The simplex unit is furnished in all sizes, while the duplex is supplied in all sizes except the 4 in. x 6in. and 36 in. x 48 in. models. The simplex unit consists of one screen compartment, one hutch and one screen box, while the duplex is equipped with two of each of these fitments. Finally, the hand of the simplex is interchangeable to left or right and may be adapted to any grinding circuit, while the hand of the duplex is determined by facing the rotating water valve. The six sizes range as follows: 4 in. x 6 in., 8 in. x 12 in., 12 in. x 18 in., 16 in. x 24 in., 24 in. x 36 in. and the 36 in. x 48 in. simplex unit. The latter unit is said to be able to handle in excess of 500 tons a day.

Simplex units in the six sizes have mill capacities ranging from 2 to 6 tons per 24 hours to 400 to 800 tons per 24 hours; while the five duplex units have mill capacities ranging from 15 to 45 tons per 24 hours to 800 to 1,600 tons per 24 hours. Water or cyanide solution capacity rises from ½ to 1 g.p.m. and 3 to 6 tons per 24 hours to 35 to 55 g.p.m. and 210 to 330 tons per 24 hours in the simplex units, and up to 4 to 6 g.p.m. and 24 to 36 tons per 24 hours and 70 to 110 g.p.m. and 420 to 660 tons per 24 hours in the duplex.

The Denver-Dowset density valve automatically controls the discharge of jig concentrate, which has in discharge a uniform cycle. Valves range in size at ¼ in., 1¼ in. and 2 in. All the jigs are available for belt, motor or petrol drive.

Safety Spectacles in Industry

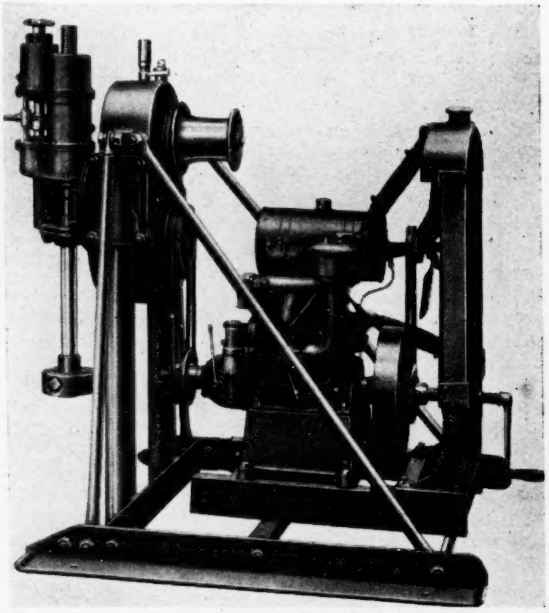
The two most important factors which determine the efficiency of safety spectacles in industry are the suitability of a particular lens as a protection against the hazards of a specific task, and the comfort and efficiency of the type of frame supplied. In an interesting pamphlet The Hadley Company Ltd. recommend Triplex unsplinterable lenses as a maximum protection factor. Protective filters to reduce glare and absorb ultra-violet and infra-red radiations are also forwarded by the manufacturers as effective eye-protection equipment. Other filters manufactured by the company are the B.S.S. laminated, Calorex, Crookes B2 industrial, and gold-fired heat-reflecting filters.

A Range of Diamond Core Drills

The XC range of diamond core drills, manufactured by the Craelius Co. Ltd., have been lately described in an interesting pamphlet. The Craelius XC-33.5 and XC-42 diamond core drills as well as the other XC designs are of the same basic construction, although the spindle of the XC-42 model allows the use of 42 mm. drill rods.

The XC model is driven by a flanged motor which has been specially designed for blast hole and core drilling and which is incorporated as part of the gear housing. The XC drill is designed for four speeds, 1,460, 980, 700 and 360 r.p.m. at 1,420 r.p.m. of motor. The unit is equipped for a bit speed of 980 r.p.m. on delivery and is supplied with three additional sets of gears capable of providing the other three speeds mentioned above. The XC has two feed ranges per 100 r.p.m. of spindle, 0—35 mm. for drilling and 0—150 mm. for reaming and flushing. The spindle has a feed length of 400 mm. and the XC unit is capable of drilling in any desired direction.

The XC-33.5 model has a drill weight of 127 kg., while the XC-42 has a drill weight of 180 kg. In both models the motor weighs 75 kg., the double column and frame each 100 kg., and the rod extractor 45 kg. Overall dimensions of the XC with rod extractor show a height of 2,000 to 2,500 mm. on double column and 1,850 mm. on frame, a length with electric motor of 925 mm. on double column and 1,500 mm. on frame, and a width of 560 mm. on double column and 1,200 mm. on frame.



The Craelius Type XC and XC-42 diamond core drill mounted on "A" frame and equipped with diesel or electric drive and cathead for rod pulling

Pressure on the drill bit is adjusted by a handwheel, with rate of speed automatically controlled by a friction clutch. This clutch is of the multiple disc type, and acts as a feed regulator. The spindle return is operated by the same handwheel. All gears in the body of the XC are completely enclosed.

The Craelius SP 75 × 60 flush pump is supplied as standard equipment for the XC model. This pump has interchangeable cylinder liners of 75 and 60 mm. diameter giving capacities of respectively 12 and 8 gallons at 106 strokes per min.

Electric Drive for Fast Strip Rolling Mill

An important order for electrical equipment for what it is stated will be the fastest mill in Great Britain for rolling tinplate strip has just been placed with the British Thomson-Houston Company. This is for the new plant at Velindre, near Swansea, of The Steel Company of Wales Ltd.

The electrical equipment will include six D.C. motors totalling 18,850 h.p. specially designed for the application, two 8,000 kW. motor-generators, and control gear of the latest type. The equipment will be used for driving a five-stand tandem cold rolling mill. This is a high-production mill and at its top speed of 5,000 f.p.m. can produce a coil of tinplate strip six miles long in six minutes. This is faster than the same company's similar mill at Trostre for which also B.T.H. supplied the electrical drive.

REVIEWS

Lost Trail, *by Francis Cunynghame. Published by Faber and Faber. Pp. 213, with index and photographic illustrations. Price 18/- net.*

The traditional excitement of a gold rush has invariably prodded to the limit the basic human emotions. Yet the work under notice presents a somewhat different aspect to that usually depicted as the preliminary mad scramble for gold. For after the digger comes the engineer, and following in the wake of the pick or panning trough is to be found the office of the geologist and the financier.

Lost Trail is an autobiographical work that tells of the activities in the Klondike of Arthur Newton Christian Treadgold, who in the evening of the last century abandoned his chosen profession of schoolmaster and repaired to the new Klondike gold fields. He foresaw that the survival of the field lay in the development of individual claims into groups, and the "consolidation of the whole gold field was due to his foresight, natural flair for geology and ability both to convince others and to borrow money to further his schemes."

The final long drawn out litigation and the judgment of the Canadian courts that ruined Treadgold is a well-known story, and to add to the nostalgic note is the realization that the estimated life of the Klondike field can be assessed at a maximum of fifteen years, and that during this short life span employment can only be found for some five to seven hundred workers on the Yukon Consolidated properties.

The author, Major Cunynghame, who is founder and first president of the company now controlling mining operations in the Klondike, knew and worked with Treadgold for forty-three years, and with certain other principal characters in this book. He has penned a human and gripping tale that holds to a high level of biography and will be of sure interest to readers connected with the mining industry the world over.

Year Book of the American Bureau of Metal Statistics.—*Thirty-Second Annual Issue for the year 1952, issued June 1953. Pp. 120. Obtainable from the American Bureau of Metal Statistics, 50 Broadway, New York, U.S.A. Price $3.00*

In keeping with the established tradition of its forerunners, the current volume of this indispensable publication presents world-wide factual data on the principal non-ferrous and precious metals.

Within its pages are tabulations and notes recording production and various statistical information such as shipments, imports, exports and stocks and usages of the non-ferrous and precious metals during the year 1952 and in previous years. The non-ferrous metals so reviewed are in order, copper, lead, tin, zinc, aluminium, antimony, cadmium, cobalt, magnesium, molybdenum and nickel. Gold, silver and platinum are included among the precious, while other subjects covered are the average scrap metal prices at New York, the general economic statistics of the United States, and the average monthly and yearly prices of the principal metals from 1898 to 1952.

Mining and Industrial Year Book of Australia, 1952.—*Seventh Edition. Published by Paterson Brokensha Pty. Ltd., Western Australia. Pp.* 207 *with illustrations.*

This well produced and most authoritative annual deals with all aspects of the mining industry of Australia and, in addition, touches upon hydro-electrical development and heavy industry. Authoritative writers deal in turn with the mining industries of the various States, while general articles include works on Swedish iron ores, the development of the industrial diamond, flameproof switchgear for mines and aspects of switchgear manufactured in Australia, as well as a survey of the Australian mining industry in 1951-1952. A mining directory section presents current data on certain mining companies operating in Australia, the Malay States, Fiji and New Zealand. A valuable book.

Quin's Metal Handbook.—*1952 Edition. Published by Metal Information Bureau Ltd. Pp. 750. Price 25s.*

Larger than any of its predecessors, the 39th edition of this well-known metals reference book contains information on a wide range of ferrous and non-ferrous metals. The work is international in its scope. Among matters referred to are prices, production, consumption, exports and imports, brands and stocks. Latest available figures have been incorporated wherever this measure was possible.

Details of brands have been revised and brought up to date, and the current issue of the handbook includes a list of those brands recognized by the London Metal Exchange up to the time of going to press. In addition, the multi-lingual dictionaries of technical terms relating to iron and steel and non-ferrous metals have been expanded, and a new feature is a large-scale diagrammatic inset in colour showing the process of zinc production.

The handbook is of considerable value, and is obtainable from the publishers at Birkett House, 27 Albermarle Street, London, W.1.

The Coal Mining Industry.—*Issued by the Central Youth Employment Executive, prepared by the Ministry of Labour and National Service and the Central Office of Information, and published under the authority of H.M. Stationery Office. Pp. 32, with illustrations. Price 1s. 3d. net. Obtainable from H.M. Stationery Office.*

This booklet is No. 39 in the "Choice of Careers" series, and is intended primarily for young people about to leave school who are thinking about their future employment. It is likely to be of interest, however, to parents, teachers and others concerned with the recruitment, allocation and training of young entrants.

The book describes the organization of the coal mining industry and includes chapters on how coal is mined, coal-face work, in the haulage roadways, at the pit bottom, work at the surface, recruitment and training, avenues of promotion in mining and wages, working hours and holidays.

A simple and informative work much enhanced by excellent photographs.

The British Electricity System.—*A United States Productivity Team Report. Published by the British Productivity Council. Pp. 58, with illustrations. Available from the British Productivity Council, 21 Tothill Street, London, S.W.1, and the Office of Technical Services, Department of Commerce, Washington, D.C. Price on application.*

This is the report submitted by a team of seventeen representatives of the U.S. electricity utility industry who visited the United Kingdom last year under the auspices of the Anglo-American Council on Productivity to make a field study of the British Electricity Authority system.

The U.S. team made a close study of the British system, and this is supported by detailed statistics. Obviously it could not in the time available do more than indicate in its recommendations those points which in its view are deserving of detailed study by the British Electricity Authority. These are summarized on page 1 and are of an important character. Several aim at the more intensive use of existing equipment, involving a less rigid interpretation of some limiting regulations, and the more effective utilization of technical staff. Others advocate the installation of larger turbo-generators and changes in present methods, notably reduction of the time lag in construction jobs by the closer timing of deliveries of equipment. It is suggested that, to reduce the cost of meter reading, customer meters should be fixed on the outside of all buildings, and wherever feasible those at present installed inside older buildings should be transferred outside. More funds should be allocated for the development of rural electrification. Members of trade unions should be educated on the need for increased productivity to raise the workers' standard of living.

An interesting point is made on page 11 of the report, concerning the quality of British coal. The report states, "The British Midlands coal, with its high ash content and slagging tendencies, around which future plant designs are being made, is approached in quality only by the Illinois, Iowa and Western Kentucky fields in the U.S. The quality of British coal which is to be available in the future is unknown. This is a matter of the utmost importance which the Coal Board should take immediate steps to resolve."

In its entirety, the report covers such subjects as size of units, hydro-electric schemes, water and the siting of stations, the proposed 275 kV grid, the manning problem, safe working practice and other aspects relating to an efficient and productive industry.

METALS, MINERALS AND ALLOYS

Mr. Harold Stassen, U.S. Mutual Security Director, told the Senate on Friday of last week that he believed that the U.S. would have to continue some sort of foreign aid for the next ten years, as he believed the Russian threat would last for that time. He denied that the British Government was proposing to "dump" up to 75,000 tons of copper in the U.S., and that U.S. funds had been employed by Britain to stockpile copper for unloading later in the United States.

Mr. Simpson is again attempting to get Congress to legislate against imports of petroleum, lead and zinc, and the House Ways and Means Committee has approved the draft of a fresh Bill which would impose sharp mandatory curbs on lead and zinc imports; while Republican leaders are reported to be planning to get the Bill on the floor of the House, Senate action is regarded as doubtful.

There is little to report regarding the metals this week, either here or in the United States, with the exception of tin which fell this week to the lowest figure since Government control ceased.

COPPER.—The freeing of copper for dealing on the London Metal Exchange at the beginning of next month, coupled with the holiday suspension of interest in the United States has combined to continue the period of watchful waiting which has characterized this market for some time past. The Ministry of Supply has notified that under the Copper, Lead and Zinc Distribution (Revocation) Order (No. 1082) licences for dealing will not be required after the beginning of next month.

While the United States price is not quotably changed, the General Cable Corporation and Phelps-Dodge have reduced their wire and cable prices. July bookings in the first week are reported as around 40,000 s.tons.

The Chilean Government has still refrained from making offers of copper at a lower price and it is suggested that as the Connecticut Brass Mills are not at present proposing any price cuts for their products, the fabricating subsidiaries of Anaconda and Kennecott are satisfied to take a fair proportion of the Chilean output at the existing price. A Chilean Government decree, freezing prices for almost everything consumed and produced in Chile has been published, following the fixing of the Exchange rate at P.110 to the $. The government has also ordained a table of bonuses for employees with salaries below P.15,100 per month, and the pegging of prices of the main consumer goods. Miners at the Braden's El Teniente mine at Sewell have stopped work, and the management says that if this is not immediately resumed, all operation will be halted owing to lack of ore.

A strike has been scheduled for next week at a Perth Amboy refinery.

LEAD.—Metal Exchange prices, after easing slightly early in the week, firmed up later and on Thursday finished virtually unchanged from a week ago. Elsewhere the metal has been mostly firm at 13½ c. New York though demand has been sporadic and only moderately good generally; sellers, however, appear confident as some consumers' holidays are ending and because a resumption of heavy lead purchases by automobile battery manufacturers is expected later this month. Lead sellers have also pointed out that the f.a.s. Gulf market has improved considerably with the Continent buying Mexican lead because of a tigher supply position abroad.

TIN.—Prices have again fallen heavily this week on the Metal Exchange and cash was down as low as £580 on Wednesday. In the United States, Straits tin was quoted at 80 c. per lb. nom Wednesday. It is too early yet to judge of the effect of this further decline in reducing world output. Meanwhile, the small Western Australian plant at Greenbushes is said to have closed down till prices improve.

The *Straits Times* has apparently proposed the formation of a local Malayan buffer tin pool, which it is suggested should be operated by way of withdrawing half the coming production, to be financed partly by the large producers while the government would make advances to small producers, the advances to be recoverable when the tin was sold. This suggestion appears to have been very coldly received by the large producers, the government and the Chinese miners. An even less practical suggestion was made by the Malayan Trade Union Council, which urged the government to study the possibility of nationalizing the tin industry, though how this would raise prices is not explained. Nationalization of the tin mines in Bolivia has not advanced prices.

Imports of tin concentrates into Malaya in June totalled 698 tons (Thailand 587, Burma 85, elsewhere 17). Total stocks of tin in Malaya above ground at the end of May were reported as 4,959 tons (4,897 a month earlier). Bolivian exports in April were 3,536 tons, making the total for the current four months 11,161 tons. May Congo output is given as 1,202 tons. World tinplate production in April is computed as 528,000 tons against 541,000 tons in March. In connection with the reported purchasing contract of Bolivian concentrates by the R.F.C., the question is posed as to what will be done on the completion of the outstanding contracts to which it is committed. Will Bolivian purchases, the amount of which is quite unknown, be substituted for the present contract to purchase Indonesian, Thailand and Congo tin, or will all these sources of supply be on a competitive basis as regards offered price?

ZINC.—Prices on the Metal Exchange have been slightly firmer this week.

U.S. June slab output is reported at 81,617 s.tons (82,422 in May). Shipments, however, declined sharply to 76,784 tons, of which 4,136 were for government account. Stocks increased to 97,285 s.tons (92,452 s.tons in May). A year earlier stocks were 63,342. Total consumption of metal in the first four months of the year was given by the U.S. Bureau of Mines as 359,197 s.tons, some 22 per cent above the figure for the corresponding period of 1952.

ALUMINIUM.—After a slight recession in April, United States production in May reached a new record at 105,477 s.tons, making the output for the first five months 594,552 s.tons. Alcoa has announced the conclusion of a new contract covering 17,000 hourly workers of the United Steel Workers' Union, a branch of the C.I.O. The new contract is for one year to July 31, 1954, and increases wages by 8½ c. per hour with other benefits. The company has forecast an increased price for aluminium as a result of these wage concessions, and it is now reported as 21.50 c. per lb. for 99 per cent metal.

In Austria the Ranshoffen plant is expected to produce some 35,000 tonnes of aluminium this year and the Lend plant at Salzburg about 6,000 tonnes.

It is officially announced from Manilla that the Reynolds

U.K. PRIMARY METAL STATISTICS—MAY

(long tons)

	Refined Copper			*Lead*†			*Slab zinc*			*Tin metal*		
	May 1953	*Jan.-May* 1953	*Jan.-May* 1952	*May* 1953	*Jan.-May* 1953	*Jan.-May* 1952	*May* 1953	*Jan.-May* 1953	*Jan.-May* 1952	*May* 1953	*Jan.-May* 1953	*Jan.-May* 1952
U.K. stocks beginning period	120,059§	91,548§	87,251§	17,144‖	23,090‖	77,167§	30,821‖	166,050§	39,659§	3,335§	4,225§	8,004
Imports	16,893	90,878	96,431	22,711	72,236	83,516	10,627	84,405	94,570	86	869	2,358
Production	6,141	41,226	62,446	7,239	30,010	36,628	5,735	28,852	26,004	2,410•	9,735•	11,828•
Consumption	14,779	97,674	157,295	17,849	90,542	78,483	13,935	72,206	80,482	1,351	7,801	10,036
Exports and Re-exports	600	956	249	397	9,523	311	289	416	54	1,152	4,235	13,754
U.K. stocks end period ‡	125,795§	125,795§	86,392§	29,007‖	29,007‖	120,261§	34,078‖	34,078‖	79,350§	3,645§	3,645§	5,357§

(Source : British Bureau of Non-Ferrous Metal Statistics)

•Estimated by International Tin Study Group. †Includes imported virgin lead and English refined from domestic ore and secondary metal. §Including any Government stocks other than strategic reserves. ‖Excluding Government held stocks. ‡In addition U.K. stocks of blister copper at the end of May were 56,705 tons ; of zinc concentrates were 56,514 tons ; and of tin in ore were 4,351 tons.

Metals Company is to establish production works with an initial production of 4,250 s.tons.

The Yugoslav economic authorities have allocated the sum of 5,800,000,000 dinars for the construction of big aluminium works at Strnisce in Slovenia. The programme for this year is 60,000 tonnes of alumina and 15,000 tonnes of crude metal rising to 30,000 tonnes in 1954.

COBALT. — The U.S. Bureau of Mines reports increasing consumption of cobalt due mainly to the greater employment of the metal in high temperature alloys. Imports in April were nearly four times those of the preceding month. The bulk of the supplies appear to be drawn from the Congo, and Belgium, which supplied 1,747,297 lb. as metal, 70,000 lb. as oxide, and 783,956 lb. as white alloy. Canada contributed 92,223 lb. in the form of ore, and 20,250 lb. in salt and compounds.

COLUMBITE.—The discovery of a rich columbite deposit on a station 60 miles from Port Headland in Western Australia is reported, with more than 2,300 acres already pegged.

MANGANESE. — A new company, Canadian Manganese Mining Corporation, has been formed by the New Delhi Mines Company to investigate a new large scale deposit of manganese ore discovered near Bathhurst, New Brunswick. The Company plans a concentration plant with a daily capacity of 5,000-10,000 s.tons at a cost of $3,000,000.

The U.S. Defence Materials Procurement Agency has now signed 5 contracts to purchase a total of 133,500 s.tons of Mexican manganese. This completes the Agency's purchasing programme for 550,000 tons of Mexican production. The contracts appear to be for very low grade material ranging around 25 per cent Mn.

TUNGSTEN.—World prices seem to be definitely firmer and enquiries are on the up grade. Supplies, however, still remain very short. Reports from abroad are to the effect that both the Continent and America are in the market.

URANIUM.—The U.K. and U.S.A., which are said to have advanced over £A1,000,000 this year to develop the Rum Jungle uranium field in the Northern Territory of Australia, are said to have provided a similar amount in the financial year just begun. The old Rum Jungle field, which has seen so many vicissitudes in the past, is now experiencing yet another boom and main shaft pithead gear and office buildings are being erected and a refinery has been ordered. How far the enormous economic difficulties which have hamstrung the Territory over most of the past century have been overcome, we have no means of knowing, but government finance may see things through where mushroom companies and speculative undertakings lacked the necessary stamina in earlier years.

PLUTONIUM.—Mr. David Shaw, project manager of the Hanford works of the U.S. Atomic Energy Commission, has announced "very spectacular" reductions in the cost of producing plutonium, vital nuclear ingredient of atomic bombs. He indicated that by doubling the amount of plant and Government investment in the Hanford project—which will total almost $1,000,000,000 when it is completed by 1955—"we may be getting out four or five times as much plutonium." The reduction in the cost of producing plutonium had resulted chiefly from improved operational methods.

GOLD.—South African output in June was 969,821 f.oz. compared with 997,896 in May. Total output for the first half year is 5,848,306 f.oz., which compares with 5,824,318 in the same period of last year. The number of natives at work in June is reported some 5,000 down at 280,403 at the end of the month.

Colombian output in April was 34,755 f.oz. which brings the production for the four months to 143,290 f.oz. as compared with 166,632 for the same period last year.

The London Metal Market

(From Our Metal Exchange Correspondent)

The drop in tin has continued with occasional rallies, only to fall to lower levels. There still seems to be an almost complete lack of buying interest on the part of consumers, whilst there have been very free offerings—particularly of metal for the cash position—which have had a depressing effect. These offerings, together with the increase of over 500 tons in the warehouse stocks last week, have resulted in the disappearance of the backwardation. There are signs that some of the Malayan producers are getting rather perturbed about the steep fall in the price of the metal, and it is reported that some of the Chinese mines in Malaya have closed down on this account. The Eastern price on Thursday morning was equivalent to £614⅞ per ton c.i.f. Europe.

Now that the details of the London Metal Exchange copper contract have been finalized, an order has been made by the U.K. Minister of Supply under which licences will no longer be required for the acquisition of copper in any form, the order being operative on and from August 5 next, on which date dealings in this metal will be resumed on the Exchange. In the meantime, negotiations with the various government departments are proceeding satisfactorily.

There is a comparatively good demand for both lead and zinc, and the undertone in these metals seems to be very firm.

Closing prices and turnovers for the week are given in the following table:—

	July 9		July 16	
	Buyers	*Sellers*	*Buyers*	*Sellers*
Tin				
Cash	£625	£630	£582½	£585
Three months	£625	£627½	£582½	£585
Settlement	£627½		£582½	
Week's turnover	865 tons		950 tons	
Lead				
Current month	£92¾	£93	£92¾	£93
Three months	£90¼	£90¾	£90	£90¼
Week's turnover	3,300 tons		4,750 tons	
Zinc				
Current month	£73	£73¼	£74¼	£74¼
Three months	£73¼	£73½	£74¼	£75
Week's turnover	2,750 tons		5,000 tons	

JULY 16 PRICES

COPPER

Electrolytic .. .. £252 0 0 d/d

TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

ANTIMONY

English (99%) delivered, 10 cwt. and over .. .. £225 per ton
Crude (70%) .. .. .. £210 per ton
Ore (60% basis) .. .. .. 20s. — 22s. nom. per unit, c.i.f.

NICKEL

99.5% (home trade) .. .. £483 per ton

OTHER METALS

Aluminium, 99·5% £150 per ton
Bismuth (min. 4 cwt. lots) 17s. lb.
Cadmium (Empire), 13s. 10d./14s. 4d. lb.
Chromium, 6s. 5d./7s. 6d. lb.
Cobalt, 20s. lb.
Gold, 248s. f.oz.
Iridium, £60 oz. nom.
Magnesium, 2s. 10½d. lb.
Manganese Metal (96%-98%) £280/£295
Osmiridium, £40 oz. nom.
Osmium, £65/70 oz. nom.
Palladium, £7 15s./£8 10s. oz.
Platinum, £27/£33 5s.
Rhodium, £42 10s. oz.
Ruthenium, £25 oz.
Quicksilver, £70 5s./£70 10s. ex-warehouse
Selenium, 30s. 6d. nom. per lb.
Silver 74d. f.oz. spot and f'd
Tellurium, 15s./16s. lb.

ORES, ALLOYS, ETC.

Bismuth .. .. 30% 5s. 6d. lb. c.i.f.
20% 3s. 9d. lb. c.i.f.

Chrome Ore—
Rhodesian Metallurgical (lumpy) £14 8s. 0d. per ton c.i.f.
„ „ (concentrates) £14 8s. 0d. per ton c.i.f.
„ „ Refractory £14 0s. 0d. per ton c.i.f.
Baluchistan Metallurgical .. £16 11s. 6d. per ton c.i.f.
Magnesite, ground calcined .. £26 - £27 d/d
Magnesite, Raw .. .. .. £10 - £11 d/d
Molybdenite (85% basis) .. 103s. 10½d. per unit c.i.f.
Wolfram (65%) .. .. .. World buying 305s. - 315s.
„ „ .. .. .. 335s. Selling
Scheelite .. .. World buying 290s. - 300s.
„ .. .. 325s. Selling
Tungsten Metal Powder (for steel manufacture) .. 25s. 9d. nom. per lb. (home)
Ferro-tungsten .. .. .. 22s. 10d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .. £35 13s. 9d. d/d per ton
Ferro-manganese, home .. .. £49 15s. 0d. per ton
Manganese Ore U.K. (48%-50%) .. .. .. 6s. 1d. per unit
Brass Wire .. .. 2s. 6½d. per lb. basis
Brass Tubes, solid drawn .. 1s. 11½d. per lb. basis

THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Kaffirs were very depressed during the last days of dealing for the old account. There was a little end-of-account selling on Monday and Tuesday, but the fall was mainly due to lack of interest. Many shares touched their lowest points in 1953. On Wednesday, the first day of dealing for the new three week account, a brighter tone was evident, a fact not fully reflected in the prices given below. Uncertainty has been caused by the postponement of the South African budget until the end of September.

In the face of this poor market showing, there was some interesting news. The Rand section of the Union Corporation quarterlies recorded higher payability and increased values from East Geduld, Geduld and Grootvlei. Results from Marievale and Van Dyk were also satisfactory. Although all mines, as expected, showed lower premium sales, East Geduld and Marievale turned in better profit figures. Elsewhere, the Stilfontein quarterlies showed 82 per cent payability and values of 358 in. dwt. Work on the extensions to the reduction plant and on the uranium plant is well in hand. The profit for the last quarter came out at £288,000 against a previous figure of £206,000. Ellaton Gold produced some encouraging, if limited, development results, giving 81 per cent payability with a value of 351 in. dwt.

The O.F.S. market, as was to be expected, closely followed the Rand, but here again there was interesting news. Merriespruit in borehole KA2 returned various satisfactory reef values including one of 2,883 in. dwt. at a depth of 2,888 ft. Rumours emanating from the Cape press suggest that the first gold bar at the Freddies South mine was poured towards the end of last week; for confirmation or denial of this it will probably be necessary to await the report at the beginning of August. St. Helena's profits for the June quarter are well in advance of those for March in spite of the fact that premium sales of gold were slightly down.

West African shares were very quiet and lacked interest. Bremang eased following the June operating profit of only £1,395 against £8,650 in May.

Among miscellaneous mines, the improvement in London and Rhodesian is attributed to favourable press comment drawing attention to the underlying asset value of the shares and the future possibilities of the company due to the Central African Federation scheme.

Diamond issues suffered a severe setback. Despite recent plain warnings by Sir Ernest Oppenheimer, investors were disappointed by the latest sales figures. Paris being closed on holiday, there was no support from that quarter.

Coppers also fell. The cautious view taken by the chairman of Selection Trust over the future outlook for base metal dividends depressed the market. Esperanza steadied after only a slight dip. The company's progress report indicates that developments are going ahead in Cyprus and that shipments of ore have been resumed. It is hoped that the rate will be accelerated from August onwards.

Eastern tin shares were all affected by the heavy fall in the metal price. Siamese were quoted ex the one-for-one share bonus and the 2s. 6d. cash payment. Bangrin shareholders are to get 22 Siamese tin shares for every 25 Bangrin units and, in addition, 10d. in cash for each Bangrin unit. British Tin Investment hardened on the improved interim dividend and the announcement that the board will consider the declaration of a second interim dividend this year. Nigerian issues were less affected, due to their columbite interests.

Lead/zinc issues were very patchy. The rally in North Broken Hill was well maintained but Lake George fell on news of the labour strike on the property.

Wankie were slightly harder on the announcement of the new capital issue plans. £4,500,000 will be raised by rights issues of shares and debentures. It is proposed to establish a third colliery and almost to double present output by the end of 1956.

FINANCE	Price July 15	+ or — on week
African & European	2 1/16	—1/16
Anglo American Corpn.	5 1/2	—1/2
Anglo-French	17/-	—6d
Anglo Transvaal Consol.	21/3	.....
Central Mining (£1 shrs.)	27/6	—7 1/2d
Consolidated Goldfields	45/9	.....
Consol. Mines Selection	22/6	—1/-
East Rand Consols	2/9	.....
General Mining	3 1/2	—1/16
H.E. Prop	36/3	.....
Henderson's Transvaal	7/9	—3d
Johnnies	49/6	—1/9
Rand Mines	3 1/16	—1/8
Rand Selection	28/9	—2/6
Strathmore Consol.	32/6	.....
Union Corp. (2/6 units)	25/3	—6d
Vereeniging Estates	3 1/16	—1/8
Writs	33/1 1/2	—1/1 1/2
West Wits	43/9	—2/-
RAND GOLD		
Blyvoors	40/9	—1/3
Brakpan	9/9	—9d
City Deep	15/7 1/2	—1/10 1/2
Consol. Main Reef	17/6	—3/1 1/2
Crown	31/3	—1/3
Daggas	3 5/16	—1/8
Doornfontein	23/9	—1/3
Durban Deep	35/7 1/2	—1/10 1/2
E. Daggas	13/9	—1/9
E. Geduld .. (4/- units)	30/7 1/2	—7 1/2d
E. Rand Props	2 1/2	—1/2
Geduld	4 1/2	—1/8
Govt. Areas	12/9	—9d
Grootvlei	20/3	—1/9
Libanon	9/6	—6d
Luipaards Vlei	23/6	—9d
Marievale	18/9	—1/6
Modderfontein East	17/6	.....
New Kleinfontein	19/4 1/2	—1/3
New Pioneer	17/9	—1/3
Randfontein	42/-	—2/6
Robinson Deep	9/9	—3d
Rose Deep	12/6	—1/3
Simmer & Jack	4/6	—4 1/2d
S.A. Lands	21/10 1/2	—1/10 1/2
Springs	4/4 1/2	—1 1/2d
Stilfontein	27/3	—1/3
Sub Nigel	2 1/16	—1/8
Van Dyk	6/6	—3d
Venterspost	12/-	—6d
Vlakfontein	12/9	—9d
Vogelstruisbult	32/3	—9d
West Driefontein	6 1/16	—1/4
W. Rand Consolidated	55/-	—1/3
Western Reefs	48/9	—1/3

O.F.S.	Price July 15	+ or — on week
Freddies	9/9	—3d
Freddies N.	8/7 1/2	—7 1/2d
Freddies S.	8/6	—9d
F. S. Geduld	2 1/2	—1/8
Geoffries	14/6	—1/3
Harmony	22/4 1/2	—1 1/2d
Loraine	8/6	—3d
Lydenburg Estates	12/6	—3d
Merriespruit	7/7 1/2	—4 1/2d
Middle Wits	14/9	—1/-
Ofsits	35/7 1/2	—1/10 1/2
President Brand	26/-	—6d
President Steyn	21/-	—7 1/2d
St. Helena	12/3	—1/3
Virginia Ord.	13/-	—9d
Welkom	19/4 1/2	—10 1/2d
Western Holdings	3 3/16	—1/8
WEST AFRICAN GOLD		
Amalgamated Banket	1/6	.....
Ariston	6/1 1/2	—1 1/2d
Ashanti	20/-	.....
Bibiani	5/6	.....
Bremang	2/4 1/2	—1 1/2d
G.C. Main Reef	3/6	.....
G.C. Selection Trust	6/-	.....
Konongo	2/4 1/2	.....
Lyndhurst Deep	1/-	.....
Marlu	1/1 1/2	—1 1/2d
Taquah & Abosso	3/1 1/2	.....
AUSTRALIAN GOLD		
Boulder Perseverance	2/4 1/2	.....
Gold Mines of Kalgoorlie	12/-	—3d
Great Boulder Prop.	9/10 1/2	—4 1/2d
Lake View and Star	14/9	—3d
Mount Morgan	17/6	+3d
North Kalgurli	14/3	+3d
Sons of Gwalia	6/9	.....
South Kalgurli	8/-	.....
Western Mining	12/3XD	—1 1/2d
MISCELLANEOUS GOLD		
Cam and Motor	9/1 1/2	+1 1/2d
Champion Reef	4/9XD	—3d
Falcon Mines	6/6	.....
Globe & Phoenix	26/-	.....
G.F. Rhodesian	4/9	—1 1/2d
London & Rhodesian	5/11 1/2	+10 1/2d
Motapa	1/10 1/2	—1 1/2d
Mysore	2/9XD	.....
Nundydroog	5/7 1/2XD	—4 1/2d
Ooregum	2/9	—3d
Oroville	9/6	.....

MISCELLANEOUS GOLD (contd.)	Price July 15	+ or — on week
St. John d'El Rey	23/6	+3d
Zams	26/-	.....
DIAMONDS & PLATINUM		
Anglo American Inv.	3 1/16	—1/16
Casts	17/9	—3d
Cons. Diam. of S.W.A.	3 1/2	—1/8
De Beers Defd. Bearer	56/-	—3/6
De Beers Pfd. Bearer	14 1/8	+1/8
Pots Platinum	7/9	—1 1/2d
Watervaal	14/-	+3d
COPPER		
Chartered	50/-	—1/-
Esperanza	4/-	—1 1/2d
Indian Copper	4/1 1/2	—1 1/2d
Messina	3 5/16	—1/16
Nchanga	6 1/16	—1/16
Rhod. Anglo-American	47/3	—1/9
Rhod. Katanga	8/9	—1 1/2d
Rhodesian Selection	13/-	—7 1/2d
Rhokana	17 1/8	—1/8
Rio Tinto	19 1/4	—1/4
Roan Antelope	12/9	—3d
Selection Trust	25/7 1/2	—3/9
Tanks	55/6	—9d
Tharsis Sulphur Br.	41/3	—3/9
TIN (Eastern)		
Ayer Hitam	21/3	.....
Bangrin	7/9	—6d
Gopeng	6/10 1/2	—6d
Hongkong	5/6	—6d
Ipoh	12/6	—1/3
Kamunting	7/9	.....
Kepong Dredging	4/3	—1 1/2d
Kinta Tin Mines	8/-	—9d
Malayan Dredging	22/3XD	—9d
Pahang	12/6	—3d
Pengkalen	7/-	.....
Petaling	8/9	—4 1/2d
Rambutan	10/3	—3d
Siamese Tin	8/3XD XB	.....
Southern Kinta	12/6	—6d
S. Malayan	20/9XD	—2/3
S. Tronoh	6/9	—3d
Sungei Kinta	10/-	.....
Tekka Taiping	4/6XD	.....
Tronoh	21/-	.....
TIN (Nigerian and Miscellaneous)		
Amalgamated Tin	8/7 1/2	—3d
Beralt Tin	27/-	+6d
Bisichi	3/6XD	—1 1/2d
British Tin Inv.	13/-XD	+9d
Ex-Lands Nigeria	4/-	.....

TIN (Nigerian and Miscellaneous) contd.	Price July 15	+ or — on week
Geevor Tin	9/6	—3d
Gold & Base Metal	3/3	.....
Jantar Nigeria	13/6	—6d
Jos Tin Area	11/3	—6d
Kaduna Prospectors	2/3XD	.....
Kaduna Syndicate	3/-XD	—1 1/2d
London Tin	4/9	+1 1/2d
United Tin	2/3	.....
SILVER, LEAD, ZINC		
Broken Hill South	41/10 1/2	+7 1/2d
Burma Mines	1/4 1/2	.....
Consol. Zinc	23/1 1/2	+4 1/2d
Lake George	9/3	—6d
Mount Isa	31/3	.....
New Broken Hill	19/9	—3d
North Broken Hill	53/9	+1/3
Rhodesian Broken Hill	10/4 1/2	—3d
San Francisco Mines	17/6	—9d
Uruwira	3/-	—1 1/2d
MISCELLANEOUS BASE METALS & COAL		
Amal. Collieries of S.A.	44/6XD	—6d
Associated Manganese	40/9	—1/6
Cape Asbestos	19/9	—3d
C.P. Manganese	52/6	+1/-
Consol. Murchison	20/6	—6d
Mashaba	4 1/2d	.....
Natal Navigation	55/-XD	—2/6
Rhod. Monteleo	5/-	—1/3
Turner & Newall	52/6	—6d
Wankie	13/6	+1 1/2d
Witbank Colliery	3 1/16	.....
CANADIAN MINES		
Dome	$31XD	.....
Hollinger	$25	+1/2
Hudson Bay Mining	$81	—1 1/2
International Nickel	$73 3/8	—1 1/8
Mining Corpn. of Canada	£4 1/4	—1/16
Noranda	$120	—2
Quemont	£6 1/4	—1/4
Yukon	4/-	+1 1/2d
OIL		
Anglo-Iranian	6 7/16	+1/16
Apex	38/9	.....
Attock	33/9XD	—7 1/2d
Burmah	46/10 1/2	.....
Canadian Eagle	27/10 1/2	—3d
Mexican Eagle	21/6	+1 1/2d
Shell (bearer)	4 7/16	+1/16
Trinidad Leasehold	25/-	—3d
T.P.D.	23/3	+9d
Ultramar	23/-	—1/4 1/2

COMPANY NEWS AND VIEWS

New Finance for Wankie

Following the announcement at the end of April that the Anglo American Corporation had taken over control of Wankie Colliery (reported in our issue of May 1, p. 505) there now comes news of the plans for raising additional finance which had already been under consideration for several months prior to the change of control.

Despite the 50 per cent increase in Wankie's output achieved during the past three years this has been nothing like sufficient to keep pace with the growth in industrial demand, as shareholders of the Copperbelt companies will be painfully aware, and quite apart from the necessity of maximizing current production to meet the immediate fuel shortage, it had been estimated that growing coal requirements throughout the Rhodesias would require an annual output of 5,000,000 tons from Wankie by 1956 compared with a current output of 2,750,000 tons.

While it has been clear for some time that further capital would be required to provide the necessary expansion in output as well as in the housing of employees and the provision of amenities, one of the major obstacles in working out acceptable issue terms for the new capital has been uncertainty with regard to the profit margin which the Southern Rhodesian Government would sanction. It will be recalled that last December agreement had been reached with the Government on a basis which ensured a maximum profit margin of 6s. 6d. per ton instead of the 5s., which had been in force since the 1923 agreement for all consumers other than Rhodesian railways, which enjoyed a 2s. preference. This agreement, however, met with such opposition in Parliament, that on a private Member's motion the proposal was rejected, and the Minister of Mines was compelled to re-negotiate with Wankie. The result of this, which was announced in the middle of May, was that average profit margins receivable by Wankie are to remain at 5s. until October, 1955, and may then rise to 5s. 3d. for the three following years while from November 1, 1958, onwards the allowable margin rises sharply to 6s. However, 1958 is a long way away and compelling reasons may well have arisen for negotiating a new agreement by that date, so that for all practical purposes the effect of the new agreement has been to keep the profit margin where it was for the present with a 5 per cent increase in a little over two years' time.

The agreement contains a number of other provisions including the introduction of an incentive scheme, whereby the company will receive, by addition to the profit margin, a substantial share of any savings effected by increased efficiency. Having regard to Anglo American's unrivalled experience of colliery organization under African conditions this may well prove to be a more valuable concession than the revision of profit margins. The agreement also specifies that the company shall set aside to reserves out of profits before tax a minimum of 20 per cent in the financial year beginning next September, rising gradually to 25 per cent in the financial year beginning September, 1957. In view of the shortened life which Wankie's existing concessions must be expected to have with the raising in annual output, the agreement also provides for the company to have first option to re-purchase or lease a portion of the concession area previously surrendered to the Government under the 1949 agreement. Finally, it is specified that the agreement will run at least for the minimum life of any debenture issues that may be made as part of the new financing operation.

It has already been envisaged that about £5,500,000 of new capital would be required for the further equipment of Nos. 1 and 2 collieries, the establishment of a third new colliery and for extensions to coking and by-product plants and ancillary installations. Wankie now proposes that only £4,500,000 should be raised forthwith and an extraordinary general meeting has been called in Salisbury for August 13, at which authority is to be sought to increase the company's authorized share capital from £3,400,000 to £6,000,000, by the creation of 5,200,000 new 10s. share.

It will be apparent from this that a portion at least of the new capital will not be obtained by an issue of shares, and the company has announced that a part will be in the form of debentures. The proportions will not, however, be announced until after the meeting. Both shares and debentures will be issued to shareholders as of right. The attractiveness of the offer for existing shareholders may very well turn on the extent to which short term loan capital is used to finance the period of expansion.

The directors anticipate that the company's profit for the year ending August 31 next will not be less than in the preceding year and they have this week declared an interim dividend of 5 per cent in respect of the current year at the same time indicating that no further distribution will be made. Dividend distributions last year also amounted to 5 per cent.

Selection Trust Looks on the Bright Side

Aside from his very pertinent comments on the taxation of British overseas mining companies (to which we refer on page 70) Mr. A. Chester Beatty, Jnr., had some interesting observations to make at last week's annual meeting of Selection Trust on the present opportunities for exploration. He made the point that, with metal prices considerably below the level of recent years, the present time provided an opportunity for a company with liquid resources to undertake exploration programmes, because " more favourable conditions exist as regards terms under which properties or prospects may be optioned or acquired and a more selective attitude can be taken and a sounder judgment made."

Mr. Chester Beatty also suggested that there were now signs of a modification, if only gradual, in the attitude of countries outside the Commonwealth to the development of their natural resources. Whereas, in some countries in the past, investment had been impractical owing to the impossibly onerous terms required by the governments concerned, realization was spreading that the development of their natural resources could often be best undertaken by non-nationals " on a basis of mutual goodwill and sound, business-like terms."

When it is recalled that Selection Trust's latest balance sheet shows liquid assets in excess of some £3,000,000, and that Trepca Mines still has to receive substantial payments from the Yugoslav Compensation Fund, these views, coming from the chairman of a group which has always been to the fore in the investigation of new mining projects, should ensure a certain alert enterest among shareholders.

As regards the company's more immediate dividend prospects, Mr. Chester Beatty does not expect to be able to maintain the dividend rates of the past two years in view of the general falls in metal prices.

West African Golds Showing Improved Results

The monthly mine returns from the West African gold producers which we publish below both for June and in cumulative form suggest a fairly consistent pattern of improved performance during the current year to date compared with the corresponding period a year ago. Aside from Bremang all companies have maintained or increased their tonnage treated and record a higher gold output. Similarly, working profit is also better (except for Bremang and Amalgamated Banket Areas), notably so in the case of Ashanti and Marlu as well as Taquah and Abosso which was running at a loss a year ago.

Company	June, 1953			Months since year end	Current Financial Year Total to date			Last Financial Year Total to date		
	Tons (000)	Yield (oz.)	Profit* (£000)		Tons (000)	Yield (oz.)	Profit* (£000)	Tons (000)	Yield (oz.)	Profit* (£000)
A.B.A.	58	9,426	21.1	9	544	82,409	161	455	75,788	179
Ariston Gold	29	9,461	38.7	9	259	88,869	416	246	85,125	415
Ashanti	23	15,000	107.2	9	206	134,500	794	174	128,854	639
Bibiani (1927)	30	6,230	24.4	9	272	55,456	149	268	53,463	125
Bremang†	491	1,772	1.4	6	3,547	16,911	78	3,720	18,875	90
G.C.M.R.	9	3,770	12.5	12	103	40,469	128	102	36,981	117
Konongo	3	2,331	10.4	9	22	20,231	92	22	19,552	85
Marlu Gold	42	3,781	12.2	9	375	36,398	116	361	33,283	69
Taquah and Abosso	24	5,813	10.3	3	75	18,452	39	63	14,115	L 30

*Including premium revenue since November, 1951. As the basis of calculating monthly profit varies from company to company a direct comparison one with another is not possible. The basis for any one company has, however, remained consistent, unless otherwise indicated.
†Ore treated given in cu. yd. L indicates a loss.

We must await the June quarterly report of Bremang to see what has accounted for the exceptionally low profit reported for June which amounted to £1,400 compared with £26,500 in the corresponding month last year. As we pointed out in this column last week, cumulative working profit for the first five months this year was nearly £13,000 up on the corresponding period of 1952 in spite of the fact that No. 2 dredge has been out of commission during the whole of this year. The June returns have, of course, altered this picture, but the fact remains that once the No. 2 dredge comes back into operation on the Offin River, a substantial improvement may be expected.

Mazapil Adopts Cautious Policy

The gross trading profit of the Mazapil Copper Company and its subsidiaries for the year to December 31 last was down by about 50 per cent to £166,524 against £336,250 in the preceding year. In the absence of more detailed information in the published report and accounts it is not possible to indicate what have been the predominant factors in this substantial contraction in trading profit. It is clear, however, that it has been considerably mitigated by a large reduction in tax liability which stands £75,655 for the year under review compared with £231,267 in 1951. This is accounted for partly by a reduction of over 50 per cent in Mexican taxes and partly by a large increase in double taxation relief.

In consequence, profits after tax at £61,266 are only some £12,750 less than in 1951, in which year the company paid a dividend of 7½ per cent which absorbed £23,625. In considering the 1952 accounts, however, the directors have not felt able to recommend a dividend in view of the drop in metal prices which has already occurred and the uncertainty of the free market future for copper, coupled with the fact that the company has a number of outstanding commitments to meet in respect of planned expenditure on plant and machinery, as well as having to carry increased consumable stores now that two copper and two lead furnaces are available for operation. This decision has been taken against a background of net current assets totalling £337,201.

During 1952, 126,817 tons of copper ores and flux were smelted averaging 3.1 per cent copper compared with 103,566 tons averaging 3 per cent in 1951. Lead ores and flux smelted totalled 45,231 tons averaging 8.11 per cent lead compared with 38,859 tons averaging 8.78.

The company's chairman and managing director, Mr. C. R. Darlington, has announced his retirement from the Board of the company to take effect after the annual meeting in Manchester on July 28. He will be succeeded as chairman by Mr. T. P. Berington, while Mr. R. A. Alldred is to be invited to join the Board with a view to his appointment in due course as managing director. It is also the Board's intention that, following Mr. Alldred's appointment, the registered office and administration of the company should be transferred from Manchester to his office at 8 Great Winchester Street, London, E.C.2.

Mr. Alldred is a director of Beralt Tin and Wolfram and Halkyn District United Mines as well as being secretary of the British Overseas Mining Association.

Ex Lands Maintains Output and Dividend

In 1952 Ex-Lands Nigeria achieved a slightly greater output than in the preceding year despite a reduction in the yardage treated. About 40 per cent of the output came from the gravel pumps, elevators and drag-line with an almost equal amount (38.5 per cent) from hand contract work, the remainder coming from tribute workings and dump reclamation.

Year to Dec. 31	*Treated (000 cu. yds.)*	*Output (tons)*	*Yield (lb./ cu. yd.)*	*Cost per* cu. yd. s. d.*	*ton £*	*Reserves† (tons)*
1950	1,772.9	712	0.73	1 0.5	169	4,658
1951	1,836.3	610	0.63	1 5.2	216	4,609
1952	1,669.1	620	0.70	1 8.3	228	4,614

*Free on rail.
†Averaging 0.90 lb. per cu. yd. in 1950 and 1951 and 0.91 lb. in 1952.

The company is pushing ahead with its plans for further mechanization and during the course of last year a Ruston-Bucyrus Monighan dragline was in course of erection and is expected to be in production this year. The Lima dragline was taken out of production last year to assist in the erection of the Monighan but will be back on productive work again this year and will operate in conjunction with three reecntly purchased 10 cu. yd. Euclid dumpers.

Although labour is reported to be in good supply there was no indication last year of any improvement in output from the hand paddocks which experienced a falling off in output of nearly 100 tons in 1951 (compared with 1950) owing to the contract gangs having entered ground which had already been partially worked.

Last year's increase in costs, although smaller than in 1951, amounted to an average of £12 a ton, due principally to higher African wages and a 12½ per cent increase in electricity charges. The principal figures for the profit and loss account are as follows:

Year to Dec. 31	*Tin Revenue* £	*Mine Costs* £	*Taxation* £	*Net Profit* £	*Dividend* %	*Carry Forward* £
1950	491,027	120,246	150,000	113,202	50	99,957
1951	428,554	131,424	96,000	59,527	50	106,984
1952	432,915	141,126	86,000	69,123	50	122,107

Production for the first six months of the current year amounted to 303 tons compared with 290 in 1952. There is reason to expect some further improvement on these figures as the draglines come into production.

The chairman is Major General W. W. Richards. Annual meeting London, July 28.

Company Shorts

Terms of Siamese-Bangrin Merger.—Following the meetings of Siamese Tin and Bangrin Tin reported elsewhere in this issue and the extraordinary general meeting of the former to authorize the necessary increase in capital (which will enable Siamese Tin to acquire the shares of Bangrin Tin in accordance with the proposed merger of these two companies reported in our issue of June 19 page 743), particulars of the proposed offer to Bangrin shareholders have now been published. The purchase price offered is 8s. 6.4d. for each Bangrin stock unit of 5s. to be satisfied partly by the issue of 22 Siamese Tin 5s. shares for every 25 Bangrin units and in part by a balance payment in cash which in cases not involving additional payments in respect of fractions, will amount to 10d. for each Bangrin stock unit. For the purposes of the above offer Siamese Tin's ordinary shares have been valued at 8s. 9d. each.

Both companies announce that no decision will be taken regarding the declaration of an interim dividend in respect of the current year until the latter part of August but that any dividend then declared will be payable to stockholders registered prior to the implementation of the above offer. At the recent annual meetings of the two companies, however, the chairman is reported to have expressed some doubt about the payment of an interim in view of the present tin price.

Renong's New Interest.—Renong Tin Dredging announces the conclusion of an agreement with Straits Tinfields Limited (a Singapore registered company) as the result of which a property known as Jinjang, situated five or six miles north of Kuala Lumpur and owned by Straits Tinfields, will be operated jointly by the two companies. Renong Tin's Gombak dredge is to be dismantled and re-erected at Jinjang where it will work for the duration of the agreement. During this time it will remain the property of Renong Tin, who will be at liberty to dismantle and remove it at the conclusion of the agreement.

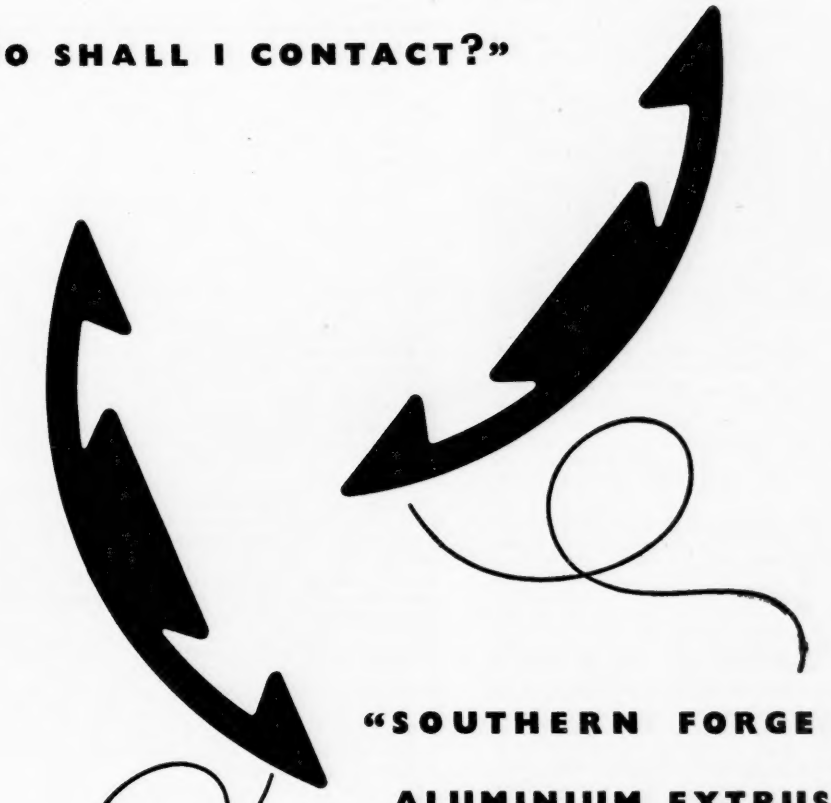
Test boring conducted by both parties to the agreement suggest that the average value of the ground to be worked will be about 0.69 lb. per cu. yd. The cost of getting the dredge into production on its new site, together with ancillary plant and equipment, and the provision of mine buildings and accommodation for staff and labour, is estimated at £280,000.

The potential working profit from this operation has been estimated by the consulting engineers, Messrs. Vallentine and Dunne, at £2,226,000 over a working life of 13 years assuming an average tin price of £600 per ton, or alternatively a profit of £3,000,000 assuming an average tin price of £800 per ton. These figures include operating costs which are put at 1s. 1d. per cu. yd. but exclude the cost of dredge removal from its present site. Renong's share of any profits would be 50 per cent.

This agreement will not affect Renong's No. 2 dredge which will remain in independent operation at Rasa.

Mount Morgan Appoint London Board.—Mount Morgan has appointed a London board of directors with effect from July 1, consisting of Mr. E. J. Morgan and Mr. R. S. Evans. Austral Development becomes London secretary of the company.

"WHO SHALL I CONTACT?"



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SELECTION TRUST

MR. A. CHESTER BEATTY, JNR'S. SPEECH

The twentieth annual general meeting of Selection Trust Ltd., was held on July 9 at Selection Trust Building, Mason's Avenue, London, E.C.2. The following is extracted from the speech of **Mr. A. Chester Beatty, Jnr.,** chairman.

Gross revenue of the company and its subsidiaries for the year ended March 31, 1953, was £1,994,000—almost exactly the same as for the previous year.

After deducting expenses there was a balance of £1,898,000, out of which its was necessary to provide £1,145,000 for taxation, compared with £1,007,000 for the previous year. The tax charge would have been higher still but for allowance for some investment losses arising in earlier years.

Although each investment is taken into the accounts at the lower of its cost or Stock Exchange value, the market value of our investments as a whole is substantially in excess of their total book value.

Exploration reserve has been credited with £150,000 and expenditure of £107,000 has been charged against it bringing the balance up to £346,000, compared with £303,000 the previous year.

Payment of a final dividend of 3s per unit of stock, less income-tax, together with the interim dividend of 1s 3d paid in January, will make a total distribution of 4s 3d per unit, less tax, compared with 4s 6d per unit, less tax, for the previous year.

Total reserves and unappropriated profits show an increase and now stand at over £1,550,000. The liquid resources of the company, after allowing for current liabilities, amount to nearly £3,000,000.

Mining is one of the most speculative types of business, and in countries such as Canada and the U.S.A., and parts of Africa, it is encouraged by appropriate taxation reliefs—particularly in the early stages of the business—which are not available to companies domiciled in the United Kingdom. In consequence there is a disadvantage in incorporating a company in this country to handle a new mining venture, and it has become our practice, when forming subsidiary companies for this purpose, to have them registered and domiciled abroad.

The United Kingdom is one of the chief countries in the world whose life blood is a supply of raw materials to be turned into exports, and unless our own organisations producing these raw materials are put into at least as favourable a position as their overseas competitors everyone in the country will suffer.

We continue to hold our substantial interests in base metal companies the most important of these being the American Metal Company.

This year there has been a setback in trading conditions and it looks as though concerns interested in the metal business will not be enjoying such good fortune as they have over the past few years. This recession was inevitable and we have been constantly making quite sure that our liquid resources will be such that we are well able to maintain our position during times of depressed markets.

The Roan Antelope and Mufulira Copper Mines and Rhodesian Selection Trust have now transferred their control to Northern Rhodesia but we still retain our interest in them through the American Metal Company.

The Tsumeb mine continues to develop well. The results for the year ended June 30, 1952, showed a net profit of £4,645,000 compared with £2,967,000 for the previous year.

Our interest in diamonds is through our holding in Consolidated African Selection Trust with its subsidiary, Sierre Leone Selection Trust. The year 1952 was a good one for the diamond market and world sales amounted to about £69,600,000, or £4,500,000 more than the previous year. Sales for the first and second quarters of 1953 were lower and totalled £31,500,000.

We still have a large interest in the Orange Free State through share holdings in Western Holdings and St. Helena, of which the former is the more important.

At Western Holdings results from underground development, which has been to some extent retarded by water difficulties encountered, have been very satisfactory.

In Canada our subsidiary company, Selco Exploration Company, Ltd., has several parties actively engaged in reconnaissance and prospecting work, but so far nothing of particular interest has been revealed.

In Southern Rhodesia we are now exploring under option through our subsidiary company, Bikita Minerals (Private), Ltd., an interesting lithium-beryllium deposit. It will, however, take further field work and the examination of many other factors before we can determine whether the merits of this property will justify our exercising the option.

HENDERSON'S TRANSVAAL ESTATES

The forty-first Annual General Meeting of Henderson's Transvaal Estates, Limited, was held in London on July 15.

Sir Joseph Ball, K.B.E. (Chairman and Managing Director), who presided, in the course of his speech said:

With the net profit, after taxation, up by some £2,000 at £46,704, your Directors recommend, for the seventh successive year, the payment of a dividend at the rate of 15 per cent., which leaves the carry forward at £57,246, up by some £200.

Turning now to the Consolidated Accounts, you will see that the consolidated net earnings amount to £81,399, which represents an increase of some £36,000 on last year's figures of £45,000, the improvement being due almost entirely to an increase in the profit derived from mining coal in South Africa.

TWEEFONTEIN UNITED COLLIERIES, LIMITED

The Company's South African coal interests are held through its subsidiary—Tweefontein United Collieries Ltd.—and I am glad to say that the accounts of the latter Company, for the year ended 31st December, 1952, show a profit on coal amounting to £168,000 as compared with £129,000 during the preceding year. The tonnage mined was 1,317,125 as compared with 1,239,635 during the preceding year, and the increases in the inland price of coal varied up to a maximum of 1s. 3d. per ton. From the 1st of July 1952, however, taxation on profits from coal mining was increased from 5s. 6d. to 6s. in the £, and on non-mining revenue from 4s. 6d. to 5s. in the £; so that, while the total net profit for the year, before taxation, was up by some £42,000, substantial proportion of this increased revenue was absorbed by increased taxation.

Outputs continue to be governed by the availability of truck supplies, and in this respect it is satisfactory to note that the improvement experienced during the latter half of 1952 is being maintained. Nevertheless, the collieries are still working below full capacity.

The embargo imposed on the export of coal in June 1951 was lifted at the end of 1952, and shipments are now being undertaken on a moderate scale

WHITE'S SOUTH AFRICAN PORTLAND CEMENT CO. LTD.

This Company enjoyed another successful year. For the twelve months ended 30th November, 1952, total deliveries amounted to approximately 519,000 tons. The total output represents an increase of some 25,000 tons on the figures for the previous twelve months.

The net profit, after allowing for taxation, amounted to £388,000 as against £431,000 during the previous year.

VRYHEID

The future of this property, which is owned by our subsidiary —Mineral Holdings Limited—has been the subject of careful consideration by the Board during the past year. Geological and geophysical work had indicated the possibility of finding workable copper deposits on Vryheid on what is known as the Dowe-Tokwe fault; but our engineers expressed the view that, in order to prove or disprove the existence of a payable mine, it would be necessary to carry out a programme of at least 350 ft. of shaft-sinking, plus a further 3,000 ft. of driving and cross-cutting, at a cost estimated in June 1952 of some £53,000 and this on the assumption that a supply of electricity could be obtained from Messina at a reasonable figure.

Shortly afterwards, however, they reported that the Messina Company had started exploratory drilling on the Dowe-Tokwe fault immediately adjacent to and west of Vryheid, and recommended that, in the circumstances, we should await the results of Messina's investigations before starting on our programme of shaft-sinking, driving and cross-cutting.

This recommendation was accepted by the Board, and there the matter rests for the present. I have, however, had a recent opportunity of discussing the matter with the Chairman of the Messina Company, who readily authorized me to inform Shareholders that, having started operations by drilling boreholes, as we did, they had come to the conclusion that, in view of the results obtained by them and by ourselves, by means of boreholes, a more satisfactory method of investigating the matter was by sinking a prospecting shaft, and by subsequent driving and cross-cutting. They are now engaged on this operation, but it will be some little time before they will be able to form a definite opinion as to the economic value of this section of their property.

He added that, in his view, judging by Messina's recent experience, the sum of £53,000 would fall substantially short of the amount which would now be required to carry out the somewhat similar programme contemplated by us in 1952.

The report and accounts were adopted.

SIAMESE TIN SYNDICATE

MR. KENNETH O. HUNTER'S REVIEW

The forty-sixth annual general meeting of Siamese Tin Syndicate Limited was held on July 9 in London, **Mr. Kenneth O. Hunter,** the chairman, presiding.

The following is an extract from his circulated statement:—

Total production from dredging operations, including those of our wholly-owned subsidiary, amounted to 1,833 tons of ore. In addition, a further 28 tons were produced from the retreatment of tin shed tailings, giving a total of 1,861 tons, which is in excess of any year's production since the war. The total output of 8,872,100 cubic yards was also a post-war record.

Apart from an important general reduction of expenditure, these excellent figures are due in great measure to two main factors; the successful return to operation of the Kota Bahru Dredge on February 21, and the increased production from the Huey Moot Dredge, which has finally left the unavoidable course through old tailings and has been working steadily in virgin ground. Further, both Peek and Koekein increased their production. The only property which produced less was Ngow, where, owing to the exhaustion of the areas available to it, No. 1 Dredge, after some 40 years' life, finally ceased to work on November 9, 1952, and is now laid up in a freshwater dock.

The consolidated profit for the year before taxation amounts to £525,814, an increase of £36,479 over 1951. This is largely due to a successful 10 month working period by the subsidiary company which made a profit of £64,479, offsetting the previous accumulated losses of £33,758 by a margin of £30,721. The net balance available, after providing for all tax liabilities and after taking into account the balance brought in from 1951 of £43,501, is £241,857. The directors recommend a final dividend of 85 per cent. (making 150 per cent. for the year).

During the year we proposed that work should start at Chemor, a property originally bored by us in 1930. This project, which had long been planned but for which no suitable dredge had hitherto been available, was intended as a joint venture on equal terms with the Bangrin Tin Dredging Co., Ltd. For this purpose, the latter's No. 2 Dredge was brought out of Siam. However, on establishing a defensible camp in one of the worst bandit areas, and excavating the erection dock, limestone bottom was encountered where none had been disclosed by the original drilling. All work was immediately suspended pending further investigation.

RESERVES

Our reserves stood at December 31, 1952, at 132,872,750 cubic yards, averaging 0.506lb. tin ore per cubic yard. Of this total 25,227,500 cubic yards, averaging 0.486lb. per cubic yard, lie in expired leases for which application for renewal has been made.

Lowland Lead Mines.—Turning to our Scottish venture, now operated jointly by the Rio Tinto Company, Limited, Bangrin Tin Dredging Co., Ltd., and ourselves with the first named as managers and under the registered name of Lowland Lead Mines, the geological reconnaissance was continued both on surface and underground wherever possible, and towards the end of the year plans were far in advance for unwatering. At Wanlockhead most of the necessary equipment for pumping is in position, the reinforced concrete shaft collar emplaced, and the adits are in course of recovery. Power at 11,000 volts is available on the spot. Unwatering may have started by the time this is published.

Present Position.—Our operations in Siam continue to progress smoothly. We have recently entered into option agreements with firms concerning the purchase of ground said to contain 68,000,000 cubic yards in south-western Siam, partly under mining leases and partly under mining lease applications, which are being examined.

It was recently announced in the Bangkok Press that the Siamese Government intended to give preference in future to their own countrymen in the granting of mining leases. The matter has been taken up by the Association of British Commonwealth Mining Interests in Siam, and the Foreign Office and our Embassy in Bangkok have been informed of the natural concern of British mining interests in Siam on this account.

The report was adopted and at a subsequent Extraordinary General Meeting resolutions were passed approving: (1) An increase in the authorized capital to £550,000, of which up to £250,000 would be available for the proposed offer to Bangrin stockholders: (2) the capitalization of £150,000 of the reserves and its distribution as one Ordinary share of 5s. each for each stock unit of 5s.; and (3) a cash distribution of 2s. 6d. per 5s. stock unit.

BANGRIN TIN DREDGING

OPERATIONS REVIEWED

The thirty-third annual general meeting of the Bangrin Tin Dredging Company Limited was held on July 9 in London, **Mr. K. O. Hunter,** the chairman, presiding.

The following is an extract from his circulated statement:—

We have in 1952 faced a difficult year. Not only has the value of our product fallen from its previous peak but for five months our operations were reduced to one working dredge, where three were working before. Production, therefore, fell by 417 tons to 687 tons of ore. Of the total output of 2,245,000 cubic yards, 2,225,000 came from ore reserves. The average price per ton obtained for our tin ore fell by £35 to £675 as compared with 1951.

Stockholders will have noted a reduction of profit from the figure of £405,633 in 1951 to £217,943 for the year under review. While the company is not liable to excess profits levy, it has been necessary to set aside £139,641 to meet income and profits tax liabilities; this provision accounts for about 64 per cent. of the profit before taxation. Taking into account the amount brought forward from last year of £31,274, the sum remaining available is £109,576, from which must be deducted £23,625 in respect of interim dividends already paid. Of the balance of £85,951 the directors have transferred £14,761 to general reserve, and now recommend the payment of a final dividend of 20 per cent., leaving £38,190 to be carried forward.

It will be noted that the gross dividend of 35 per cent. on the nominal capital represents 17 per cent. on the net assets standing in the books of the company at December 31, 1952.

During the year No. 2 dredge was removed from Siam to Chemor, a property in North Kinta, Perak, Malaya, owned by Siamese Tin Syndicate Limited; this the two companies were proposing to work as a joint venture on equal terms. However, on establishing a defensible camp in one of the worst bandit areas, and excavating the erecting dock, limestone bottom was encountered where none had been disclosed by the original drilling. All work was immediately suspended pending further investigation. The dredge remains dismantled and under care and maintenance at Chemor.

PROSPECTING AND RESERVES

Towards the end of 1951 boring was begun in a favourable area of tailings which, combined with the remnants of virgin ground, has disclosed 954,000 cubic yards of additional material; this is being worked profitably by No. 1 dredge.

Our Eastern general manager reports that our total ore reserves amounted to 35,400,000 cubic yards averaging 0.56lb. tin ore per cubic yard at the end of 1952. Of this total some 4,700,000 cubic yards, averaging 0.72lb., lie in isolated blocks or are gravel pumping areas. The remaining 30,700,000 cubic yards, averaging 0.53lb. per cubic yard, comprise the present dredging area. The recovery factor has proved to be 79 per cent.

It should be realized that, owing to the necessity of docking both dredges on a single area of hard ground above high tide because of working in tidal waters, the dredge courses have been dictated by circumstances to have lain during the past two years in ground of higher value than the average. Future returns, therefore, must be expected to be somewhat lower.

Lowland Lead Mines.—Turning to our Scottish venture, now operated jointly by the Rio Tinto Company Limited, Siamese Tin Syndicate Limited, and ourselves, with the first named as managers and under the registered name of Lowland Lead Mines, the geological reconnaissance was continued both on surface and underground wherever possible, and towards the end of the year plans were far in advance for unwatering. At Wanlockhead most of the necessary equipment for pumping is in position, the reinforced concrete shaft collar emplaced, and the adits are in course of recovery. Power at 11,000 volts is available on the spot. Expenditure from January 1 to April 30, 1953 (April 18 at the mines) amounted to £37,519. In addition, orders and other commitments in hand amounted to £16,339. Our company's share of the total of £53,858 is £13,195.

It was recently announced in the Bangkok Press that the Siamese Government intended to give preference in future to their own countrymen in the granting of mining leases. The matter has been taken up by the Association of British Commonwealth Mining Interests in Siam, and the Foreign Office and our Embassy in Bangkok have been informed of the natural concern of British mining interests in Siam on this account.

The report and accounts were adopted.

KILLINGHALL TIN

DIVIDEND 25 PER CENT

The twenty-third annual general meeting of Killinghall Tin, Ltd., was held on July 10 in London, **Mr. Jack Addinsell,** the chairman, presiding.

The following are extracts from his circulated statement for the year ended September 30, 1952:—

Last year the General Managers anticipated that prospects for the year under review would be favourable, and this has been borne out by the increase in tonnage of tin ore recovered by the dredge during the year from 465 tons to 621 tons. The profit, after allowing for Depreciation, Head Office expenses, etc., amounted to £178,230. Taxation absorbs the very large sum of £127,100 and it is noteworthy that this figure, together with export duty paid to Malayan Government of £66,672, represents no less than 79 per cent. of our earnings.

An interim dividend of 15 per cent. was paid in February of this year and your directors now recommend a final dividend of 10 per cent., which will require £8,250 net, making a total distribution for the year of 25 per cent.

The sum of £6,868 has been expended to date on the company's share in the Grab Dredger (Experimental) Syndicate and it is anticipated the erection of the unit will commence shortly and experiments should begin towards the end of this year.

The first six months' work of the current financial year produced an output of tin ore of 220 tons and a satisfactory working profit at the mine, but you will see from the General Managers' Report that the output may be at a lower level than previously.

The forecasting of future results is rendered almost impossible by the severe fall in the tin price and uncertainty in regard to its level in the future. With the price of tin at its present level and the existing cost of materials, labour and compulsory charges, few mines can hope to make reasonable profits unless they happen to be working rich ground. Although every effort is being made to reduce costs to a minimum continuance of present price levels cannot fail to cause a reduction of output from Malaya and other tin producing countries.

Prospects for the current year are considered to be satisfactory, although the output may be at a lower level.

The report was adopted.

HARMONY GOLD MINING COMPANY LIMITED

(Incorporated in the Union of South Africa)

NOTICE OF EXTRAORDINARY GENERAL MEETING

NOTICE IS HEREBY GIVEN that an Extraordinary General Meeting of Harmony Gold Mining Company Limited will be held in the Board Room, Second Floor, The Corner House, Commissioner Street, Johannesburg, at 11 a.m. on Friday, July 31, 1953, for the purpose of considering and, if thought fit, of passing with or without modification the following resolution as an Ordinary Resolution, namely:—

"THAT pursuant to the provisions of Article 58 of the Company's Articles of Association, the Directors of the Company be and they are hereby authorized at their discretion and at such time or times and upon such terms as they may deem fit, to borrow or raise or secure the payment of any sum or sums of money which may be required for the purposes of the Company not exceeding £6,000,000 (Six million pounds) in all."

The Transfer Books and Register of Members will be closed from July 25, 1953, to July 31, 1953, both days inclusive.

In terms of the Companies Act, as amended, of the Union of South Africa, a member entitled to attend and vote at a meeting may appoint a proxy, or where allowed, one or more proxies to attend and vote on a poll and speak in his stead. A proxy need not be a member of the Company.

By order of the Board,

RAND MINES, LIMITED,
Secretaries.
per J. S. MITCHLEY.

Registered Office:
THE CORNER HOUSE,
COMMISSION STREET,
JOHANNESBURG, TRANSVAAL.

July 8, 1953.

DIVIDENDS

Amalgamated Metal Corporation 8%
Anglo Transvaal Consolidated Investment 50%
Assoc. Manganese Mines of South Africa 90% *i*
Eastern Transvaal Cons. Mines 7½%
Kaduna Prospectors 20$\frac{5}{18}$% (August 8).
Kaduna Syndicate 50% (August 8).
Lake View and Star 3d. *i* (August 28)
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